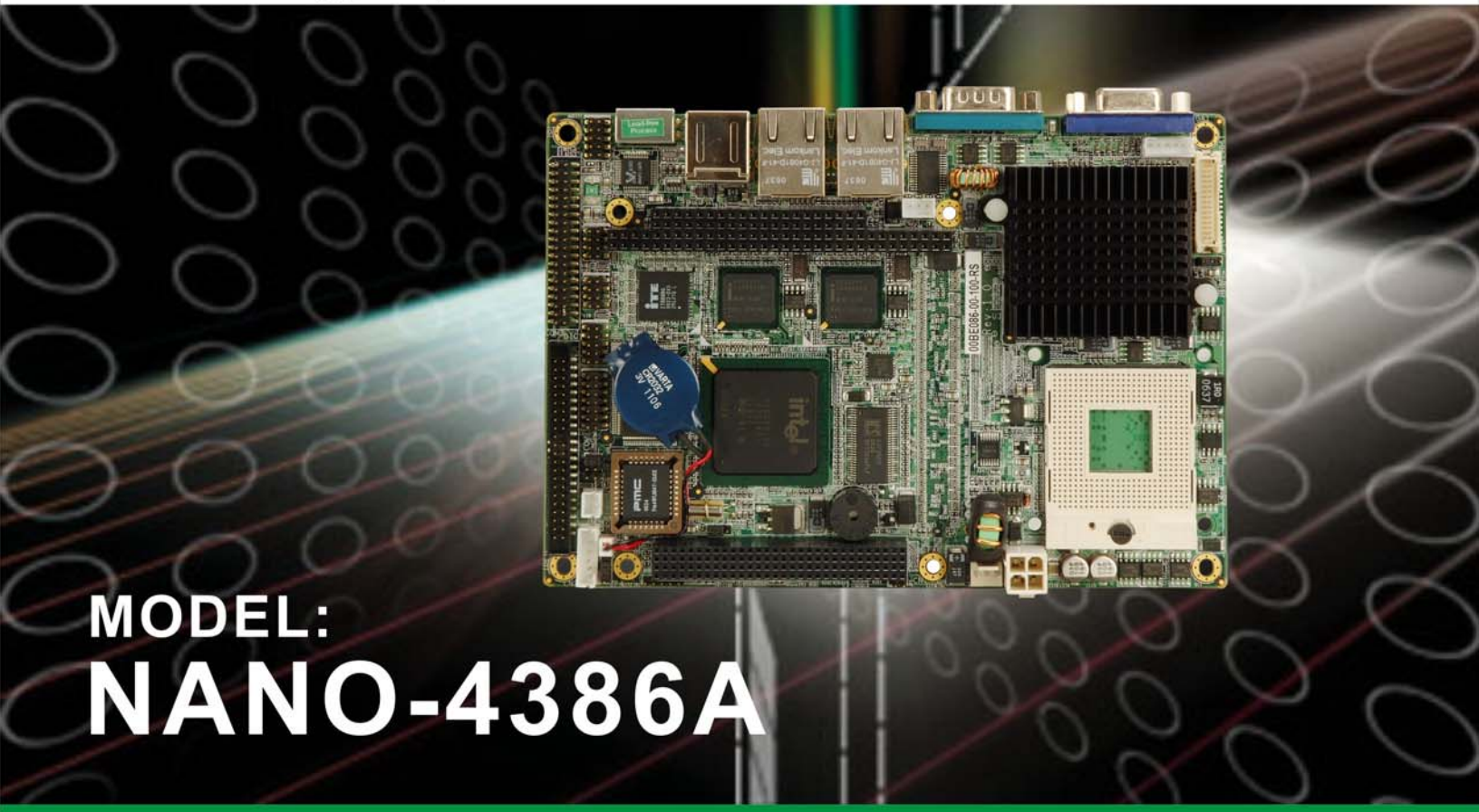
IEI Technology Corp.



MODEL:

NANO-4386A

EPIC Intel Pentium M/Celeron M CPU with VGA/LVDS, Dual GbE, Audio, and 6xCOM

User Manual

Rev. 1.01 June 2007

RoHS Lead Free

Revision

MODEL	NANO-4386A Motherboard	
Revision Number	Description	Date of Issue
1.01	Updated Dimension Drawings	June 2007
1.00	Initial release	April 2007

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Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the NANO-4386A motherboard from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the NANO-4386A motherboard package.

- 1 x NANO-4386A Single Board Computer
- 1 x Mini Jumper Pack (P/N: 33100-000079-RS)
- 1 x IDE flat cable 44p/44p (P/N: 32200-000009-RS)
- 1 x Audio Cable (P/N: 32000-000147-RS)
- 1 x 4 RS-232 Adapter cable (P/N: 32200-025401-RS)
- 1 x Power cable (P/N: 32100-087100-RS)
- 1 x Utility CD (P/N: IEI-7B000-000104-RS)
- 1 x QIG (Quick Installation Guide)

Images of the above items are shown in **Chapter 3**.

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Glossary

AC'97	Audio Codec 97
ACPI	Advanced Configuration and Power Interface
APM	Advanced Power Management
ARMD	ATAPI Removable Media Device
ASKIR	Shift Keyed Infrared
ATA	Advanced Technology Attachments
BIOS	Basic Input/Output System
CFII	Compact Flash Type 2
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
Codec	Compressor/Decompressor
COM	Serial Port
DAC	Digital to Analog Converter
DDR	Double Data Rate
DIMM	Dual Inline Memory Module
DIO	Digital Input/Output
DMA	Direct Memory Access
EIDE	Enhanced IDE
EIST	Enhanced Intel SpeedStep Technology
FDD	Floppy Disk Drive
FDC	Floppy Disk Connector
FFIO	Flexible File Input/Output
FIFO	First In/First Out
FSB	Front Side Bus
IrDA	Infrared Data Association
HDD	Hard Disk Drive
IDE	Integrated Data Electronics
I/O	Input/Output
ICH4	I/O Controller Hub 4
L1 Cache	Level 1 Cache
L2 Cache	Level 2 Cache
LCD	Liquid Crystal Display
LPT	Parallel Port Connector
LVDS	Low Voltage Differential Signaling
MAC	Media Access Controller
OS	Operating System
PCI	Peripheral Connect Interface
PIO	Programmed Input Output
PnP	Plug and Play
POST	Power On Self Test
RAM	Random Access Memory
SATA	Serial ATA
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology
SPD	Serial Presence Detect
S/PDI	Sony/Philips Digital Interface
SDRAM	Synchronous Dynamic Random Access Memory
SIR	Serial Infrared
UART	Universal Asynchronous Receiver-transmitter
USB	Universal Serial Bus
VGA	Video Graphics Adapter

Chapter

1

Introduction

1.1 NANO-4386A Overview

The NANO-4386A motherboard is an Intel® Pentium® M/Celeron® M CPU platform with an Intel® 852GM Chipset and Intel® I/O Controller Hub 4 (ICH4) Southbridge. The NANO-4386A has a maximum front side bus (FSB) frequency of 400MHz, supports up to 1GB of dual channel 266MHz DDR SO-DIMM RAM and comes with VGA, LVDS, PS/2 keyboard/mouse and COM port interfaces as well as a dual Intel® 82551ER or 82541P1 (GbE) chipsets. The NANO-4386A supports up to two IDE hard disk drives, six USB 2.0 devices, Infrared Data Association (IrDA) communications and expansion is via a PC/104-Plus interface. If RAID support for the system is required, please contact an IEI sales representative, or send an email to sales@iei.com.tw.

1.1.1 NANO-4386A Features

Some of the NANO-4386A features are listed below.

- EPIC form factor
- RoHS compliant
- Support for the following CPUs:
  - Socket 479 Intel® Pentium® M
  - Socket 479 Intel® Celeron® M
- Maximum FSB of 400MHz
- A 200-pin single channel 266MHz DDR SO-DIMM supports up to 1GB of memory
- Dual Intel® 82551ER Ethernet/Dual Intel® 82541PI GbE chipsets
- Realtek ALC655 – AC'97 audio
- Two Ultra ATA 100, Ultra ATA 66 or Ultra ATA 33 IDE HDDs supported
- Six USB 2.0 devices supported
- Six COM ports supported
- LVDS supported

1.2 NANO-4386A Overview

1.2.1 NANO-4386A Overview Photo

The NANO-4386A has a wide variety of internal and external peripheral connectors. The peripheral connectors are connected to devices including storage devices, display devices and communications devices. A labeled photo of the peripheral connectors on the front side of the motherboard is shown in **Figure 1-1**.

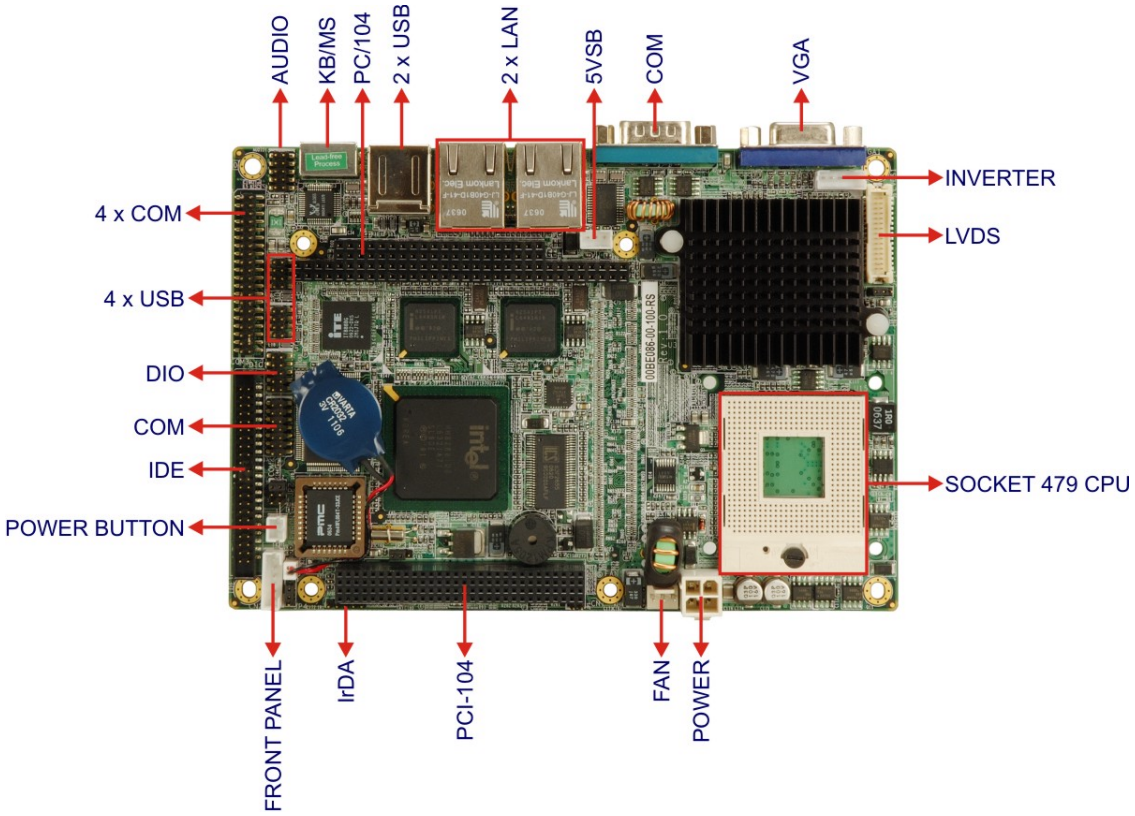

Figure 1-1: NANO-4386A Overview - Front

A labeled photo of the peripheral connectors on the front side of the motherboard is shown in Figure 1-2.

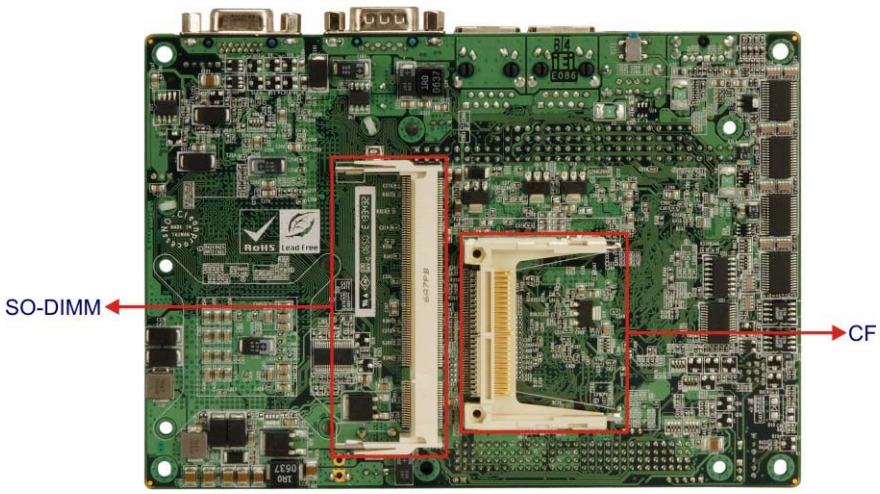

Figure 1-2: NANO-4386A Overview - Back

1.2.2 NANO-4386A Peripheral Connectors and Jumpers

The NANO-4386A has the following on-board connectors:

- 1 x 12V power connector
- 1 x ATX power connector
- 1 x Audio connector
- 1 x Battery connector
- 1 x CompactFlash socket
- 1 x DDR SO-DIMM socket
- 1 x DIO connector
- 1 x Fan connector
- 1 x Front panel connector
- 1 x IDE disk drive connector
- 1 x Infrared interface connector
- 1 x Inverter connector
- 1 x LVDS connector
- 1 x PC/104 connector
- 1 x PCI-104 connector

- 6 x Serial port connectors
- 6 x USB connectors

The NANO-4386A has the following external peripheral interface connectors on the board rear panel:

- 1 x PS/2 dual keyboard/mouse connector
- 1 x Serial port connector
- 1 x VGA connector
- 2 x Ethernet connectors
- 2 x USB connectors

The NANO-4386A has the following on-board jumpers:

- CF Master/Slave Setup
- Clear CMOS
- COM2 RS-232/422/485 Setup
- LCD Voltage Setup
- PCI-104 Voltage Setup

1.2.3 Technical Specifications

NANO-4386A technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in Chapter 2.

Specification	NANO-4386A
Form Factor	EPIC
System CPU	Socket 479 Intel® Pentium® M (up to 2.10GHz) Socket 479 Intel® Celeron® M (up to 1.40GHz)
Front Side Bus	400MHz
System Chipset	Northbridge: Intel® 852GM Southbridge: Intel® ICH4
Memory	One 200-pin single channel DDR 266MHz SO-DIMM up to1GB
Display	- VGA Integrated in Intel® 852GM

Specification	NANO-4386A
	- 18-bit dual channel LVDS
BIOS	AMI BIOS
Audio	Realtek ALC655 AC'97 codec
LAN	- Dual Intel® 82551ER Ethernet chipsets - Dual Intel® 82541PI GbE chipsets
COM	Six on-board serial ports: Five on-board RS-232 serial ports One on-board RS-232/422/485 serial port (by jumper setting)
USB 2.0	Six USB 2.0 devices supported
IDE	One 44-pin IDE connects up to two Ultra ATA33/66/100 devices
Keyboard/mouse	One PS/2 connector supports mouse and keyboard connectivity
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Power Supply	12V@2.7A, 5VSB@ 0.22A (Intel® Celeron® M 1.4GHz CPU with 512MB DDR 266MHz)
Temperature	0ºC ~ 60ºC (32ºF~140ºF)
Humidity (operating)	5%~95% non-condensing
Dimensions	165mm x 115mm
Weight (GW/NW)	800g/233kg

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Overview

This chapter describes the specifications and on-board features of the NANO-4386A in detail.

2.2 Dimensions

2.2.1 Board Dimensions

The dimensions of the board are listed below and shown in **Figure 2-1**.

- **Length**: 165 mm
- **Width**: 115 mm

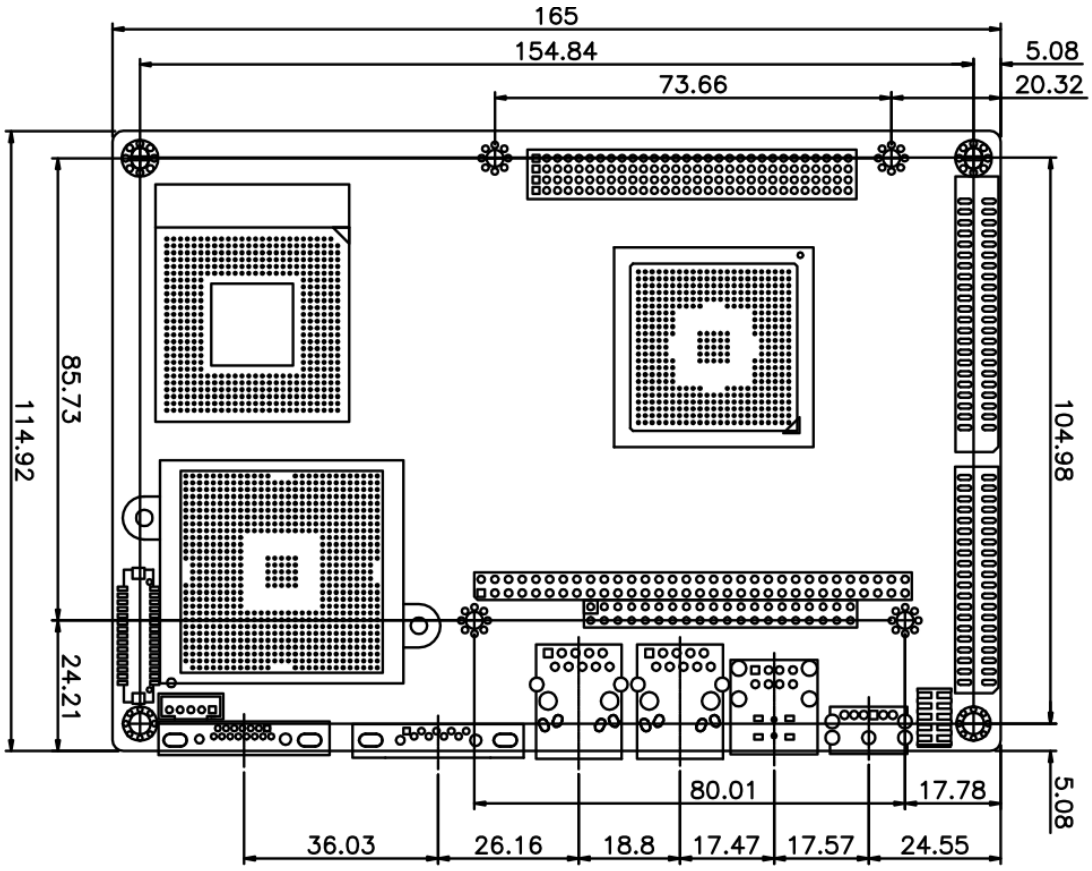

Figure 2-1: NANO-4386A Dimensions (mm)

2.2.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.

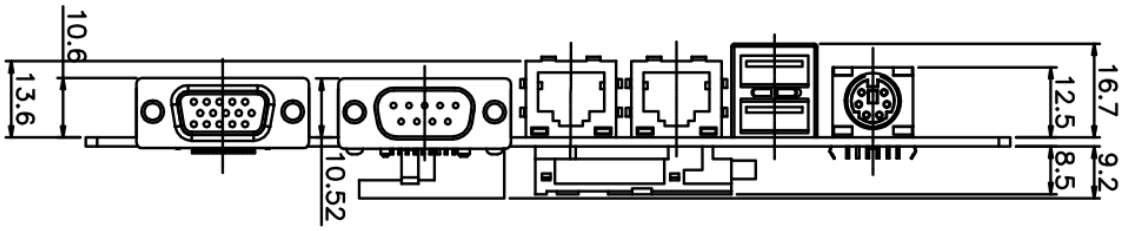

Figure 2-2: External Interface Panel Dimensions (mm)

2.3 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

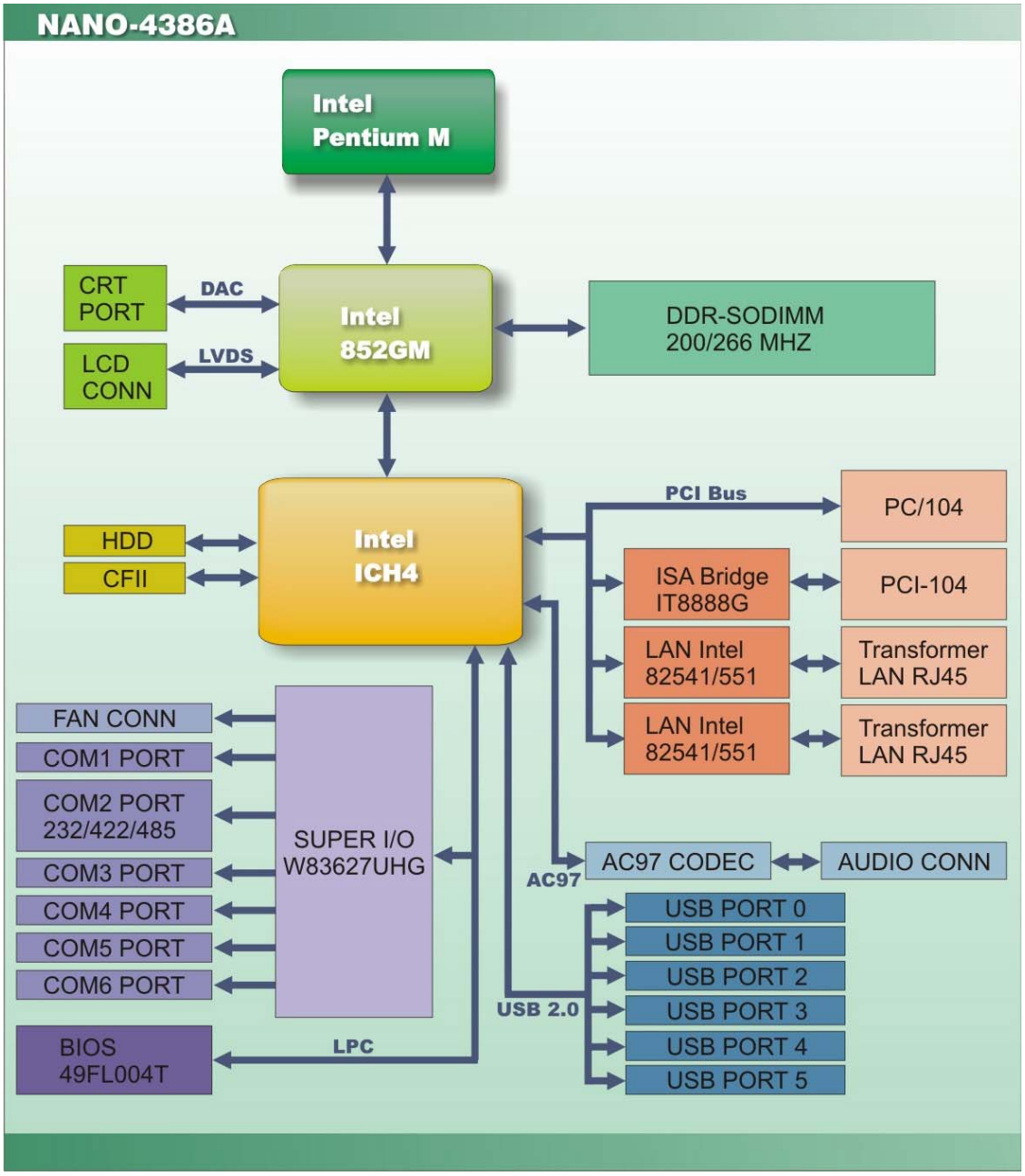

Figure 2-3: Data Flow Block Diagram

2.4 Compatible Processors

2.4.1 CPU Overview

Socket 479 Intel® Pentium® M and Intel® Celeron® M processors can be installed on the NANO-4386A motherboard.

2.4.2 Supported Intel® Pentium® M Processors

Specifications for the compatible Intel® Pentium® M processors are listed in **Table 2-1**.

CPU Speed	Bus Speed	Mfg. Tech	Cache	Package	Processor No.
2.10GHz	400 MHz	90 nm	2 MB	Socket 479	-
1.60 GHz	400 MHz	90 nm	2 MB	Socket 479	778
1.40 GHz	400 MHz	90 nm	2 MB	Socket 479	-

Table 2-1: Supported Intel® Pentium® M Processors

2.4.3 Supported Intel® Celeron® M Processors

Specifications for the compatible Intel® Celeron® M processors are listed in **Table 2-2**.

CPU Speed	Bus Speed	Mfg. Tech	Cache	Package	Processor No.
1.40 GHz	400 MHz	90 nm	1 MB	Socket 479	360
1.30 GHz	400 MHz	90 nm	1 MB	Socket 479	350
900 MHz	400 MHz	90 nm	512 KB	Socket 479	353

Table 2-2: Supported Intel® Celeron® M Processors

2.5 Intel® 852GM Northbridge Chipset

2.5.1 Intel® 852GM Overview

The Intel 852GM GMCH is a graphics memory controller hub (GMCH) component for mobile platforms. It provides the processor interface, system memory interface

(DDR-SDRAM), Hub interface, CRT, LVDS, and one DVO port. An ACPI-compliant Intel 852GM chipset platform can support the Full-On (S0), Power On Suspend (S1-M), Suspend to RAM (S3), Suspend to Disk (S4), and Soft-Off (S5) power management states. Through the use of an appropriate LAN device, the chipset also supports wake-on LAN for remote administration and troubleshooting. The Intel 852GM GMCH integrates the following:

- 400-MHz processor Front Side Bus (FSB) controller
- Graphics controller interface
- Dual Channel 18 bit LVDS interface for TFT panel support
- One Digital Video Out Port (DVO)
- Supports DDR200/266 MHz memory technology
- High-speed Accelerated Hub Architecture interface for communication with the ICH4-M

2.5.2 Intel® 852GM Memory Support

The Intel® 852GM supports one, 1GB, 266MHz single channel DDR SO-DIMM. The memory socket is shown in **Figure 2-4**.

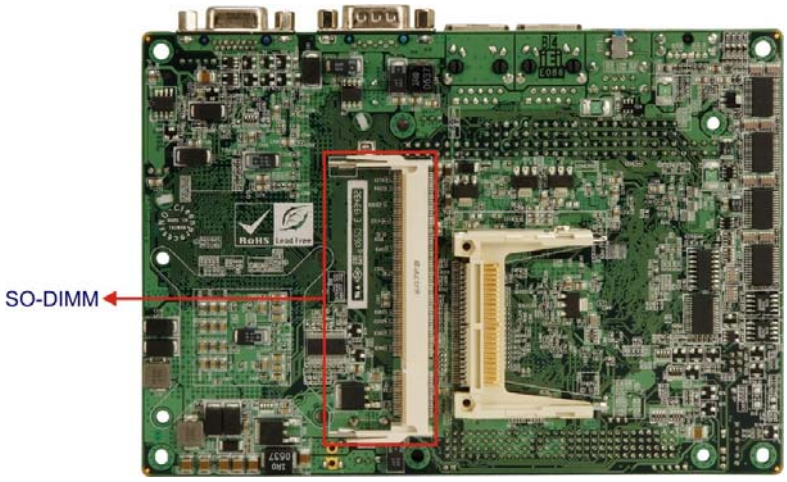

Figure 2-4: 200-pin SO-DIMM Socket

2.5.3 Intel® 852GM Integrated Graphics Controller

The Intel® 852GM has a graphics controller integrated into the chipset. Some of the features of the Intel® 852GM Integrated Graphics Controller are listed below.

- Graphics Core Frequency of 133 MHz
- 3D Graphics Engine
  - 3D Setup and Render Engine
  - High quality performance Texture Engine
- Analog Display Support
  - 350-MHz integrated 24-bit RAMDAC
  - Hardware color cursor support
  - Accompanying I2C and DDC channels provided through multiplexed interface
  - Hotplug and display support
  - Dual independent pipe for dual independent display
- Digital Video Out Port (DVO) support
  - Single channel DVO Port with 165-MHz dot clock support for a 12-bit interface
  - Compliant with DVI Specification 1.0
- Dedicated LFP (local flat panel) interface
  - Single or dual channel LVDS TFT panel support up to SXGA+ panel resolution with frequency range from 25 MHz to 112 MHz per channel
  - SSC support of 0.5%, 1.0%, and 2.5% center and down spread with external SSC clock
  - Dual Display Twin (Single pipe LVDS+CRT) is not supported if SSC is enabled
  - Supports data format of 18 bpp
  - LCD panel power sequencing compliant with SPWG timing specification
  - Compliant with ANSI/TIA/EIA –644-1995 spec
  - Integrated PWM interface for LCD backlight inverter control
  - Compliant with CPIS Specification 1.5

2.6 Intel® ICH4 Southbridge Chipset

2.6.1 Intel® ICH4 Overview

The ICH4 southbridge chipset features are listed below.

- PCI Bus Interface supports PCI Revision 2.2 Specification at 33 MHz and 133 MB/sec maximum throughput
- Integrated LAN Controller with 10/100 Mbit/sec Ethernet support
- Integrated IDE Controller supports Ultra ATA/100/66/33, BMIDE and PIO modes
- USB includes one EHCI high-speed USB 2.0 Host Controller and supports legacy keyboard/mouse software
- AC-Link for Audio supports AC ’97 2.3
- Interrupt Controller
- 1.5 V operation with 3.3 V I/O
- Timers Based on 82C54
- Power Management Logic is ACPI 2.0 compliant
- Enhanced Hub Interface
- Firmware Hub (FWH) Interface supports BIOS memory size up to 8 MB
- Low Pin Count (LPC) Interface supports two Master/DMA devices
- Enhanced DMA Controller
- Real-Time Clock 256-byte battery-backed CMOS RAM
- Supports SMBus 2.0 Specification
- GPIO

2.6.2 Intel® ICH4 Audio Codec ’97 Controller

The Audio Codec ’97 (AC’97) controller integrated into the ICH4 complies with AC’97 Component Specification, Version 2.3. The AC’97 controller is connected to the onboard audio connector. The audio connector is connected to an optional 5.1 channel or 7.1 channel audio kit with an embedded AC’97 audio codec. The AC’97 controller supports up to six PCM audio output channels. Complete surround sound requires six-channel audio consisting of:

- Front left

- Front right
- Back left
- Back right
- Center
- Subwoofer

2.6.3 Intel® ICH4 IDE Interface

The integrated IDE interface on the ICH4 southbridge supports two IDE hard disks and ATAPI devices, PIO IDE transfers up to 16MB/s and Ultra ATA transfers of 100MB/s. The integrated IDE interface is able to support the following IDE HDDs:

- **Ultra ATA/100**, with data transfer rates up to 100MB/s
- **Ultra ATA/66**, with data transfer rates up to 66MB/s
- **Ultra ATA/33**, with data transfer rates up to 33MB/s

Table 2-3 shows the supported HDD specifications.

Specification	Ultra ATA/100	Ultra ATA/66	Ultra ATA/33
IDE devices	2	2	2
PIO Mode	0 – 4	0 – 4	0 – 4
PIO Max Transfer Rate	16.6 MB/s	16.6 MB/s	16.6 MB/s
DMA/UDMA designation	UDMA 3 - 4	UDMA 3 – 4	UDMA 2
DMA/UDMA Max Transfer	100MB/s	66MB/s	33MB/s
Controller Interface	5V	5V	5V

Table 2-3: Supported HDD Specifications

2.6.4 Intel® ICH4 Low Pin Count (LPC) Interface

The ICH4 LPC interface complies with the LPC 1.0 specifications. The LPC bus from the ICH4 is connected to the following components:

- BIOS chipset
- Super I/O chipset

2.6.5 Intel® ICH4 PCI Interface

The ICH4 PCI interface provides a 33 MHz, Rev. 2.2 compliant implementation. All PCI signals are 5 V tolerant, except PME#. The ICH4 integrates a PCI arbiter that supports up to six external PCI bus masters in addition to the internal ICH4 requests.

2.6.6 Intel® ICH4 Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH4. The RTC operates on a 3V battery and 32.768KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.6.7 Intel® ICH4 USB Controller

Up to six high-speed, full-speed or low-speed USB devices are supported by the ICH4. High-speed USB 2.0, with data transfers of up to 480Mb/s, is enabled with the ICH4 integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the four ICH4 integrated Universal Host Controller Interface (UHCI) controller.

2.7 PCI Bus

The PCI bus controller on the ICH4 southbridge is compliant with PCI Revision 2.2 specifications and has a 33MHz PCI clock.

2.8 LPC Bus Components

2.8.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset

2.8.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

2.8.3 Super I/O chipset

The Winbond W83627UHG Super I/O chipset is connected to the ICH4 southbridge through the LPC bus. The Winbond W83627UHG is an LPC interface-based Super I/O device that comes with Environment Controller integration. Some of the features of the Winbond W83627UHG chipset are listed below:

- Meet LPC Spec. 1.01
- Support LDRQ# (LPC DMA), SERIRQ (Serial IRQ)
- Integrated hardware monitor functions
- Compliant with Microsoft PC2000/PC2001 Hardware Design Guide
- Support DPM (Device Power Management), ACPI
- Programmable configuration settings
- Single 24- or 48-MHz clock input

Some of the Super I/O features are described in more detail below.

2.8.3.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.01. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.8.3.2 Super I/O 16C550 UARTs

The onboard Super I/O UARTs has the following:

- Six high-speed, 16550-compatible UARTs with 16-byte send/receive FIFOs
- MIDI compatible
- Fully programmable serial-interface characteristics:
  - 5, 6, 7 or 8-bit characters
  - Even, odd or no parity bit generation/detection
  - 1, 1.5 or 2 stop-bit generation
- Internal diagnostic capabilities:
  - Loop-back controls for communications link fault isolation
  - Break, parity, overrun, framing error simulation
- Programmable baud rate generator allows division of clock source by any value from 1 to (2^{16}-1)
- Maximum baud rate up to 921K bps for clock source is 14.769 MHz and 1.5M bps for 24 MHz

2.8.3.3 Super I/O Hardware Monitor

The Super I/O Hardware Monitor hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu. Features include:

- Smart Fan control system, supporting Smart Fan™ I - “Thermal Cruise™” and “Speed Cruise™” modes and Smart Fan™ III functions
- Programmable critical temperature to speed fan fully while current temperature exceeds this temperature during Thermal Cruise™mode
- Two thermal inputs from optionally-remote thermistors or thermal diode output
- Support current mode (dual current source) temperature measurement method
- Eight voltage inputs (CPUVCORE, VIN [0..2] and intrinsic 5VCC, AVCC , 5VSB, VBAT)
- Two fan-speed monitoring inputs
- Two fan-speed controls
- Dual mode for fan control (PWM and DC)
- Built-in case open detection circuit

- Programmable hysteresis and setting points for all monitored items
- Over-temperature indicator output
- Issue SMI#, OVT# to activate system protection
- Winbond Hardware Doctor™ Support
- Provide I2C interface to read / write registers

2.8.3.4 Super I/O Parallel Port

The Super I/O parallel port (LPT) features are listed below.

- Compatible with IBM parallel port
- Support PS/2-compatible bi-directional parallel port
- Support Enhanced Parallel Port (EPP) - Compatible with IEEE 1284 specification
- Support Extended Capabilities Port (ECP) - Compatible with IEEE 1284 specification
- Enhanced printer port back-drive current protection

2.8.3.5 Super I/O Keyboard Controller

The Super I/O keyboard controller features are listed below.

- 8042-based keyboard controller
- Support Phoenix MultiKey/42TM firmware
- Asynchronous Access to two data registers and one status register
- Software-compatible with 8042
- Support PS/2 mouse
- Support port 92
- Support both interrupt and polling modes
- Fast Gate A20 and Hardware Keyboard Reset
- 8-bit timer / counter
- Support binary and BCD arithmetic
- 6, 8, 12, or 16 MHz operating frequency

2.8.3.6 Super I/O Infrared (IrDA)

The Super I/O infrared features are listed below.

- Support IrDA version 1.0 SIR protocol with maximum baud rate up to 115.2K bps
- Support SHARP ASK-IR protocol with maximum baud rate up to 57,600 bps

2.8.3.7 Super I/O General Purpose I/O (GPIO) Ports

The Super I/O GPIO features are listed below.

- 45 programmable general purpose I/O ports
- GP25, GP26 and GP27 can distinguish that input pins have any transitions by reading registers and all of 3 GPIOs also can assert PSOUT# or PME# to wake-up system if each them has any transition.

2.9 Environmental and Power Specifications

2.9.1 System Monitoring

Three thermal inputs on the NANO-4386A Super I/O Enhanced Hardware Monitor the following temperatures:

- System temperature
- CPU temperature

Voltage inputs on the NANO-4386A Super I/O Enhanced Hardware Monitor the following voltages:

- Vcore
- +2.5V
- +3.3V
- +5.0V
- +12.0V
- 5VSB

The NANO-4386A Super I/O Enhanced Hardware Monitor also monitors the following voltages internally:

- VBAT

The NANO-4386A Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.9.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the NANO-4386A are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. A heat sink is also mounted on the northbridge chipset to ensure the operating temperature of the chip remains low.

2.9.3 Power Consumption

Table 2-4 shows the power consumption parameters for the NANO-4386A running with an Intel® Celeron® M, 1.4 GHz CPU with 512MB of 266MHz DDR memory.

Voltage	Current
+12V	2.7A
5VSB	0.22A

Table 2-4: Power Consumption

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Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the NANO-4386A may result in permanent damage to the NANO-4386A and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the NANO-4386A. Dry climates are especially susceptible to ESD. It is critical that the following anti-static precautions are strictly adhered to whenever handling the NANO-4386A or any other electrical component.

- ***Wear an anti-static wristband*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the NANO-4386A.
- ***Self-grounding*** - Touch a grounded conducting material before handling and periodically while handling the NANO-4386A.
- ***Use an anti-static pad*** - When configuring the NANO-4386A, place it on an antic-static pad to reduce the possibility of ESD damage.
- ***Only handle the edges of the NANO-4386A*** - When handling the NANO-4386A, hold it by its edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the NANO-4386A is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the NANO-4386A does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist

NOTE:

If any components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the NANO-4386A was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

3.3.1 Package Contents

The NANO-4386A is shipped with the following components:

Quantity	Item and Part Number	Image
1	NANO-4386A	
1	IDE Flat Cable 44p/44p (P/N: 32200-000009-RS)	
1	Audio Cable (P/N: 32200-000147-RS)	

Quantity	Item and Part Number	Image
1	4 x RS-232 Adapter Cable (P/N: 32200-025401-RS)	
1	Power Cable (P/N: 32100-087100-RS)	
1	Mini jumper Pack (P/N: 33100-000079-RS)	
1	Quick Installation Guide	
1	Utility CD (P/N: IEI-7B000-000104-RS)	

Table 3-1: Package List Contents

3.3.2 Optional Components

The following optional components are available from IEI.

Item and Part Number	Image
CPU cooling kit (P/N: CF-479B-RS)	
RS-232/422/485 Cable (P/N: 32200-026500-RS)	

USB Cable (P/N: 32000-070300-RS)	
4 COM Port Adapter Board (P/N: IO-KIT-4COM-R10)	

Table 3-2: Optional Components

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Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 4.1.1 shows peripheral interface connector locations. **Section 4.1.2** lists all the peripheral interface connectors seen in **Section 4.1.1**.

4.1.1 NANO-4386A Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers on the front of the motherboard.

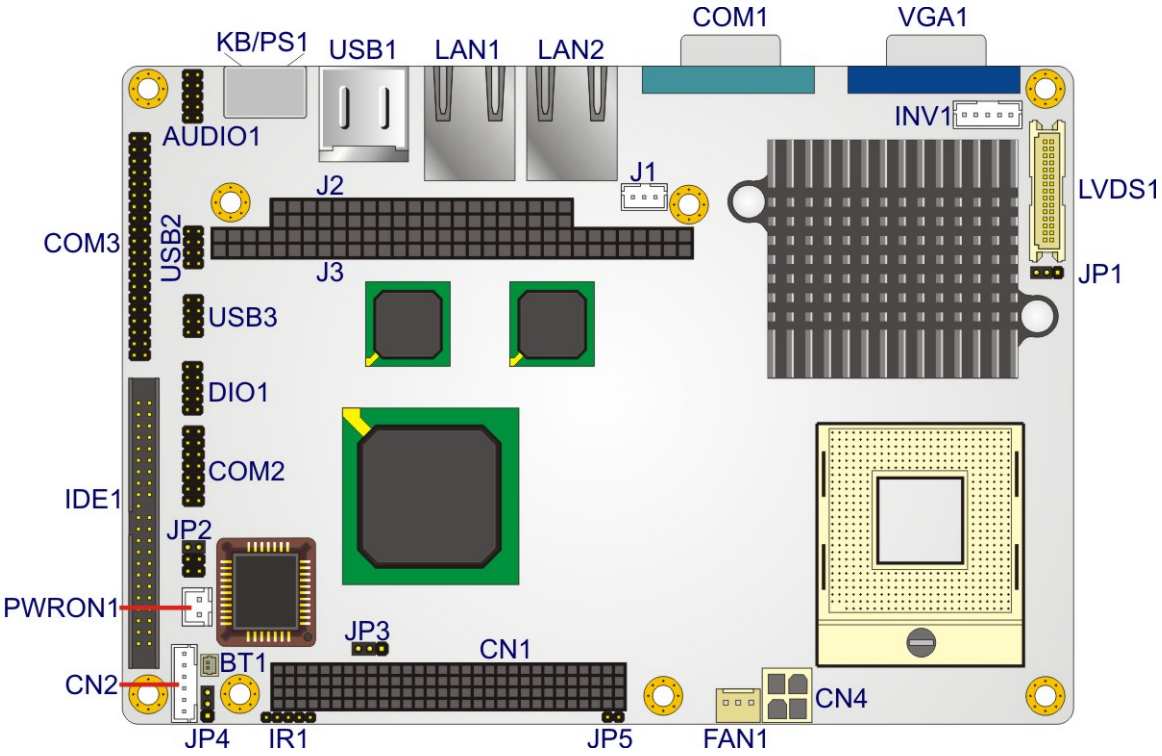


Figure 4-1: Connector and Jumper Locations - Front

Figure 4-2 shows the on-board peripheral connectors on the back of the motherboard.

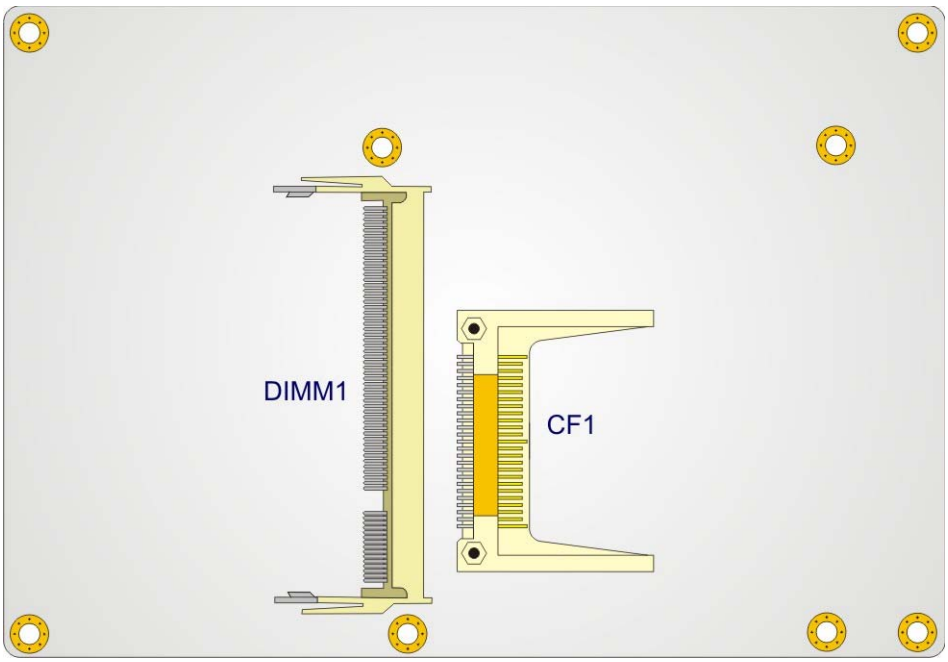


Figure 4-2: Connector and Jumper Locations - Back

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the NANO-4386A. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
+5VSB power connector	3-pin wafer	J1
+12V power connector	4-pin header	CN4
Audio connector	10-pin header	AUDIO1
Battery connector	2-pin wafer	BT1
CompactFlash connector	50-pin CF socket	CF1
Digital input/output connector	10-pin header	DIO1
Fan connector	3-pin wafer	FAN1
Front panel connector	6-pin wafer	CN2
IDE Interface connector	44-pin box header	IDE1
Infrared connector	5-pin header	IR1

Connector	Type	Label
Inverter connector	5-pin wafer	INV1
LVDS connector	30-pin crimp connector	LVDS1
PC/104 connector	104-pin connector	J2, J3
PCI-104 connector	120-pin connector	CN1
Power On connector	2-pin wafer	PWRON1
Serial port connector (4 x RS-232)	40-pin header	COM3
Serial port connector (RS-232/422/485)	14-pin header	COM2
SO-DIMM socket	200-pin socket	DIMM1
USB connector	8-pin header	USB2
USB connector	8-pin header	USB3

Table 4-1: Peripheral Interface Connectors

4.1.3 External Peripheral Interface Panel Connectors

Table 4-2 lists the external peripheral interface panel connectors on the NANO-4386A. Detailed descriptions of these connectors can be found in.

Connector	Type	Label
Ethernet connector	RJ-45 connector	LAN1
Ethernet connector	RJ-45 connector	LAN2
Keyboard/Mouse	PS/2	KB/PS1
Serial connector	DB-9 (male)	COM1
USB connector	Dual RJ-45 connector	USB1
VGA connector	DB-15 (female)	VGA1

Table 4-2: External Peripheral Interface Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the NANO-4386A.

4.2.1 +5VSB Connector (3-pins)

CN Label: J1

CN Type: 3-pin wafer connector

CN Location: See **Figure 4-3**

CN Pinouts: See **Table 4-3**

The +5VSB connector enables the NANO-4386A to be connected to an ATX power supply.

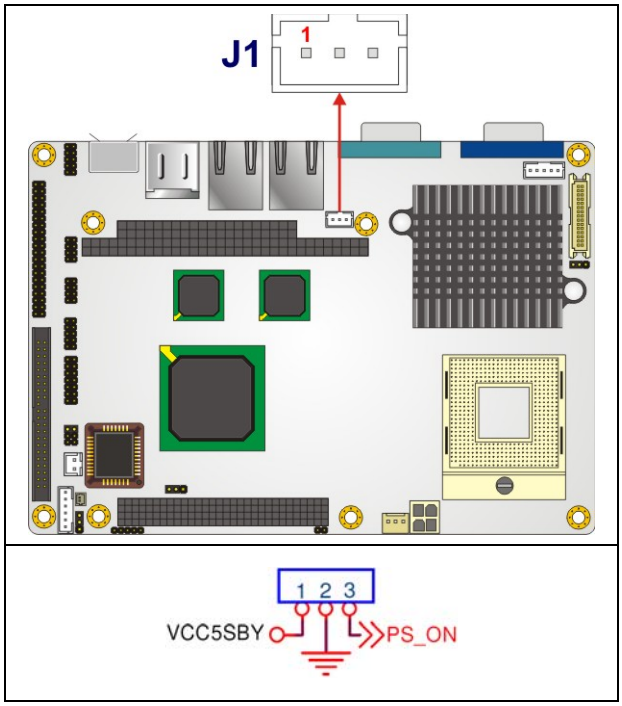


Figure 4-3: +5VSB Connector Location

PIN	DESCRIPTION
1	VCC5SBY
2	GND
3	PS_ON

Table 4-3: +5VSB Connector Pinouts

4.2.2 12V Power Connector (4-pins)

CN Label: CN4

CN Type: 4-pin connector (2x2)

CN Location: See Figure 4-4

CN Pinouts: See Table 4-4

The 4-pin 12V power supply connector connects to a +12V AT power supply.

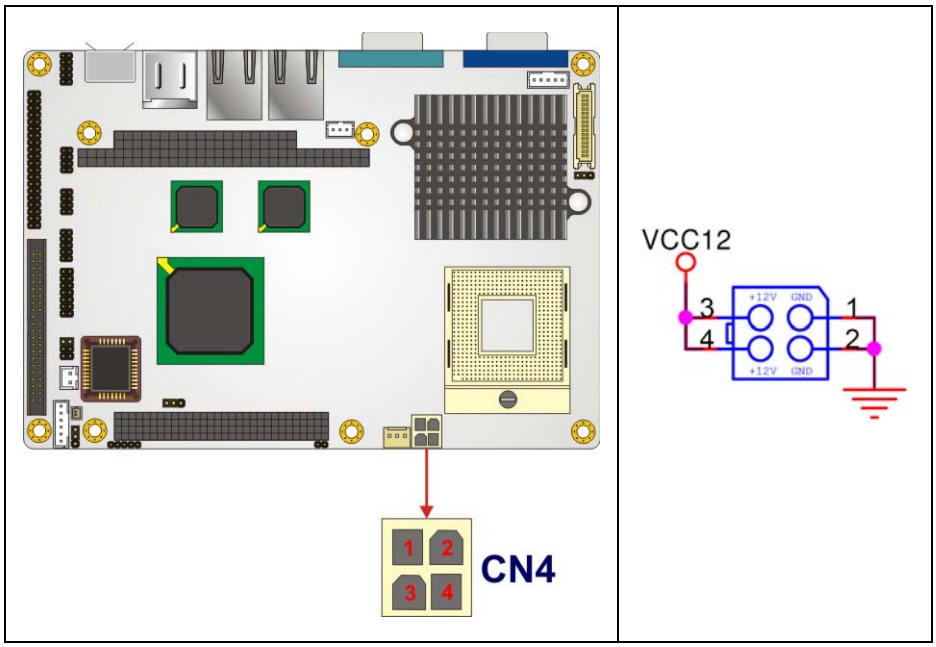


Figure 4-4: 12V Power Connector (4-pins) Location

PIN	DESCRIPTION
1	GND
2	GND
3	+12V
4	+12V

Table 4-4: 12V Power Connector (4-pins) Pinouts

4.2.3 Audio Connector (10-pin)

CN Label: AUDIO1

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-5**

CN Pinouts: See **Table 4-5**

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

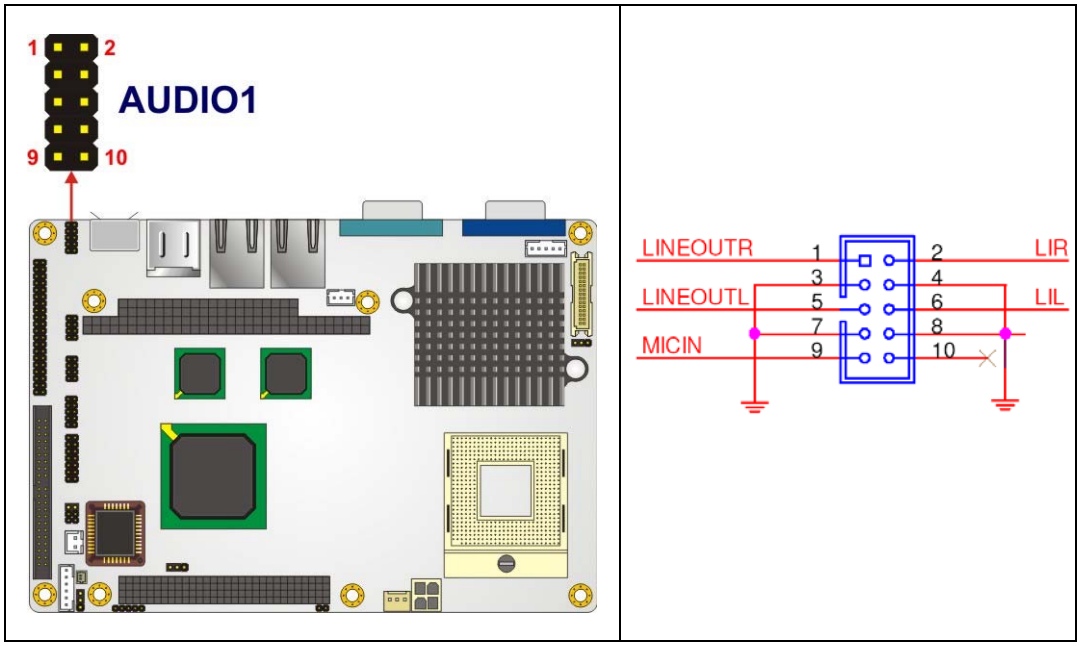


Figure 4-5: Audio Connector Location (8-pin)

PIN	DESCRIPTION	PIN	DESCRIPTION
1	LINE_OUTR	2	LINEIN_R
3	GND	4	GND
5	LINE_OUTL	6	LINEIN_L
7	GND	8	GND
9	MICIN	10	N/C

Table 4-5: Audio Connector Pinouts (10-pin)

4.2.4 Battery Connector (2-pin)

CN Label: BT1

CN Type: 2-pin wafer

CN Location: See **Figure 4-6**

CN Pinouts: See **Table 4-6**

The battery connector is connected to a backup battery. The battery connector is also used to reset the CMOS memory if the incorrect BIOS settings have been made and the system cannot boot up.

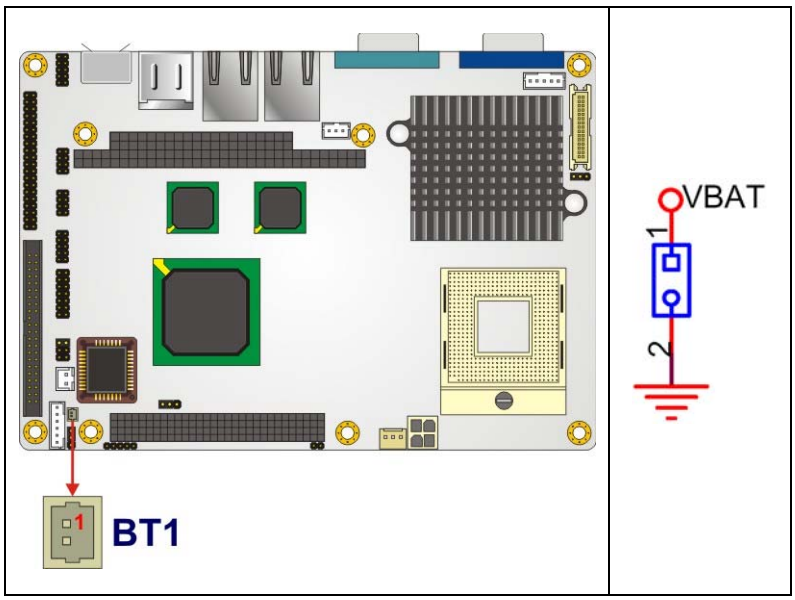


Figure 4-6: Battery Connector Location (2-pin)

PIN	DESCRIPTION
1	Battery+
2	Ground

Table 4-6: Battery Connector Pinouts (2-pin)

4.2.5 Compact Flash Socket

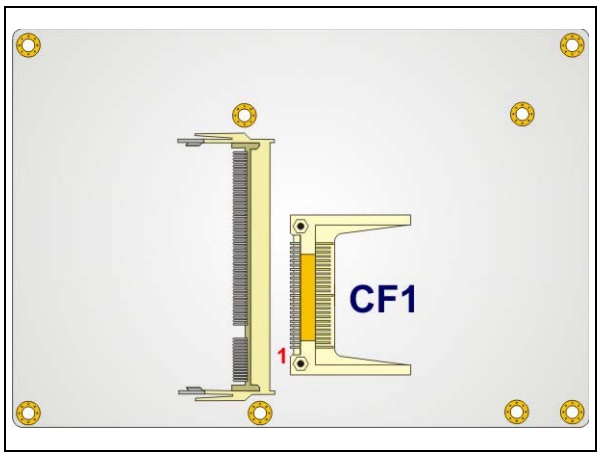
CN Label: **CF1**

CN Type: 50-pin socket (2x25)

CN Location: See **Figure 4-7**

CN Pinouts: See **Table 4-7**

A CF Type I or Type II memory card inserts into the CF socket on the motherboard.



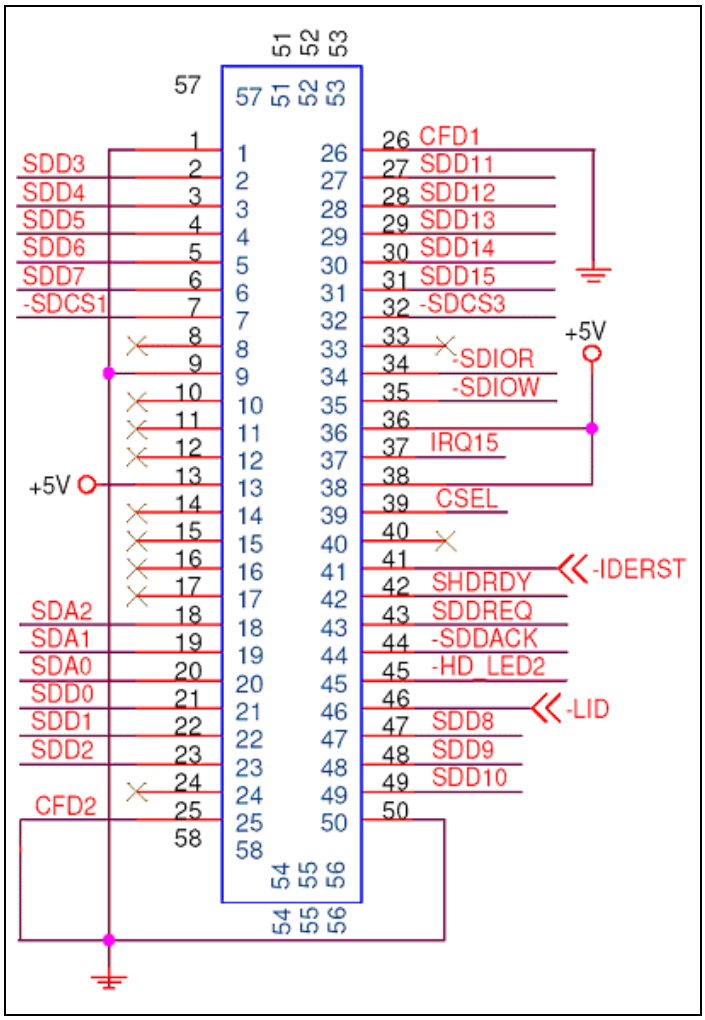


Figure 4-7: CF Card Socket Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#

PIN	DESCRIPTION	PIN	DESCRIPTION
10	N/C	35	IOW#
11	N/C	36	VCC_COM
12	N/C	37	IRQ15
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 4-7: CF Card Socket Pinouts

4.2.6 Digital Input/Output (DIO) Connector

CN Label: DIO1

CN Type: 10-pin header (2x5)

CN Location: See **Figure 4-8**

CN Pinouts: See **Table 4-8**

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

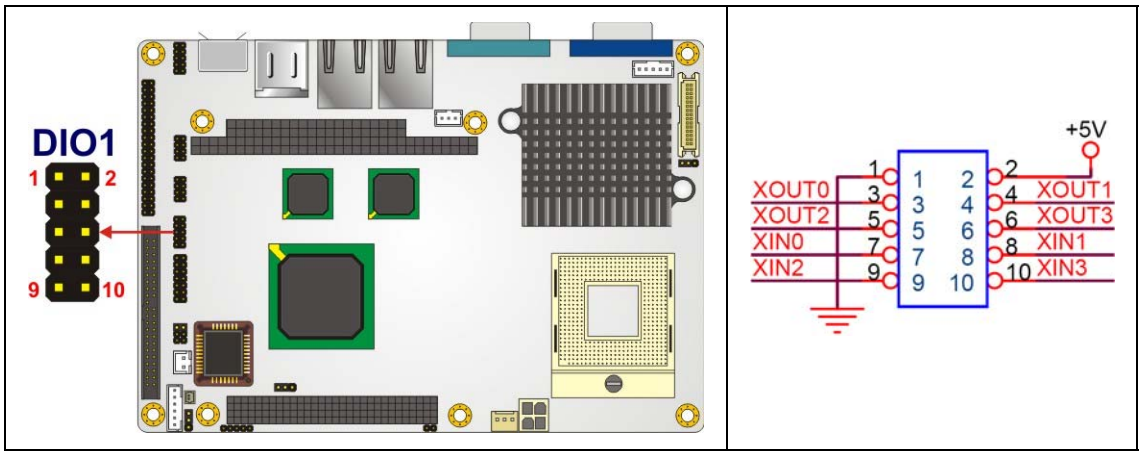


Figure 4-8: DIO Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	PWR (+5V)
3	XOUT0	4	XOUT1
5	XOUT2	6	XOUT3
7	XIN0	8	XIN1
9	XIN2	10	XIN3

Table 4-8: DIO Connector Pinouts

4.2.7 Fan Connector

CN Label: FAN1

CN Type: 3-pin wafer

CN Location: See **Figure 4-9**

CN Pinouts: See **Table 4-9**

The cooling fan connector provides a 12V, 500mA current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

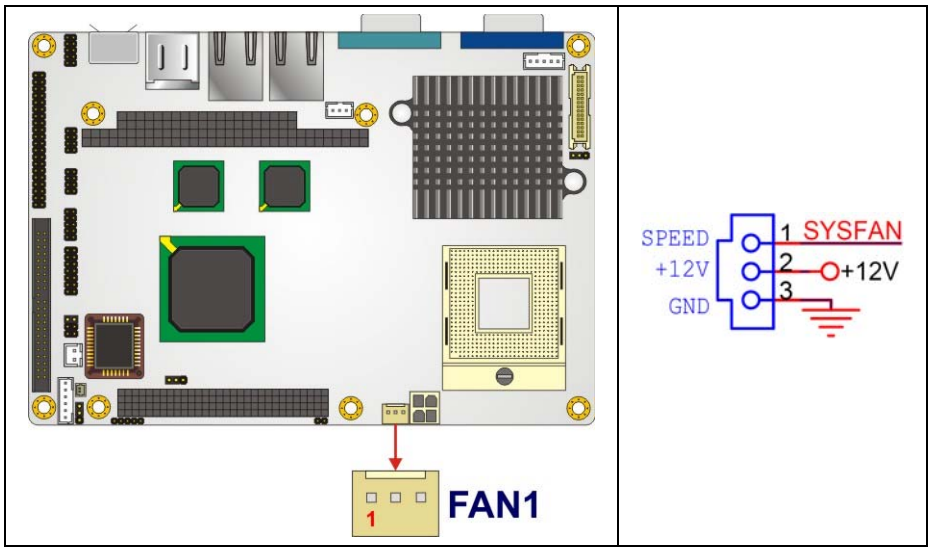


Figure 4-9: Fan Connector Location

PIN	FAN1
1	Rotation Signal
2	+12V
3	GND

Table 4-9: Fan Connector Pinouts

4.2.8 Front Panel Connector

CN Label: CN2

CN Type: 6-pin wafer (1x6)

CN Location: See **Figure 4-10**

CN Pinouts: See **Table 4-10**

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power LED
- HDD LED

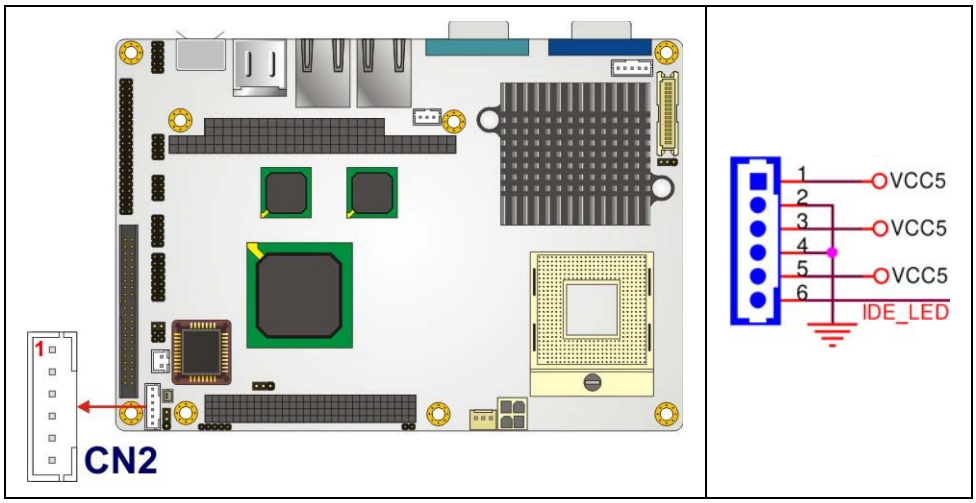


Figure 4-10: Front Panel Connector Pinout Locations

PIN	DESCRIPTION
1	VCC5
2	GND
3	POWER LED+
4	POWER LED-
5	HDD LED+
6	HDD LED-

Table 4-10: Front Panel Connector Pinouts

4.2.9 IDE Connector (44-pin)

CN Label: IDE1

CN Type: 44-pin header (2x22)

CN Location: See **Figure 4-11**

CN Pinouts: See **Table 4-11**

One 44-pin IDE device connector on the NANO-4386A supports connectivity to two hard disk drives.

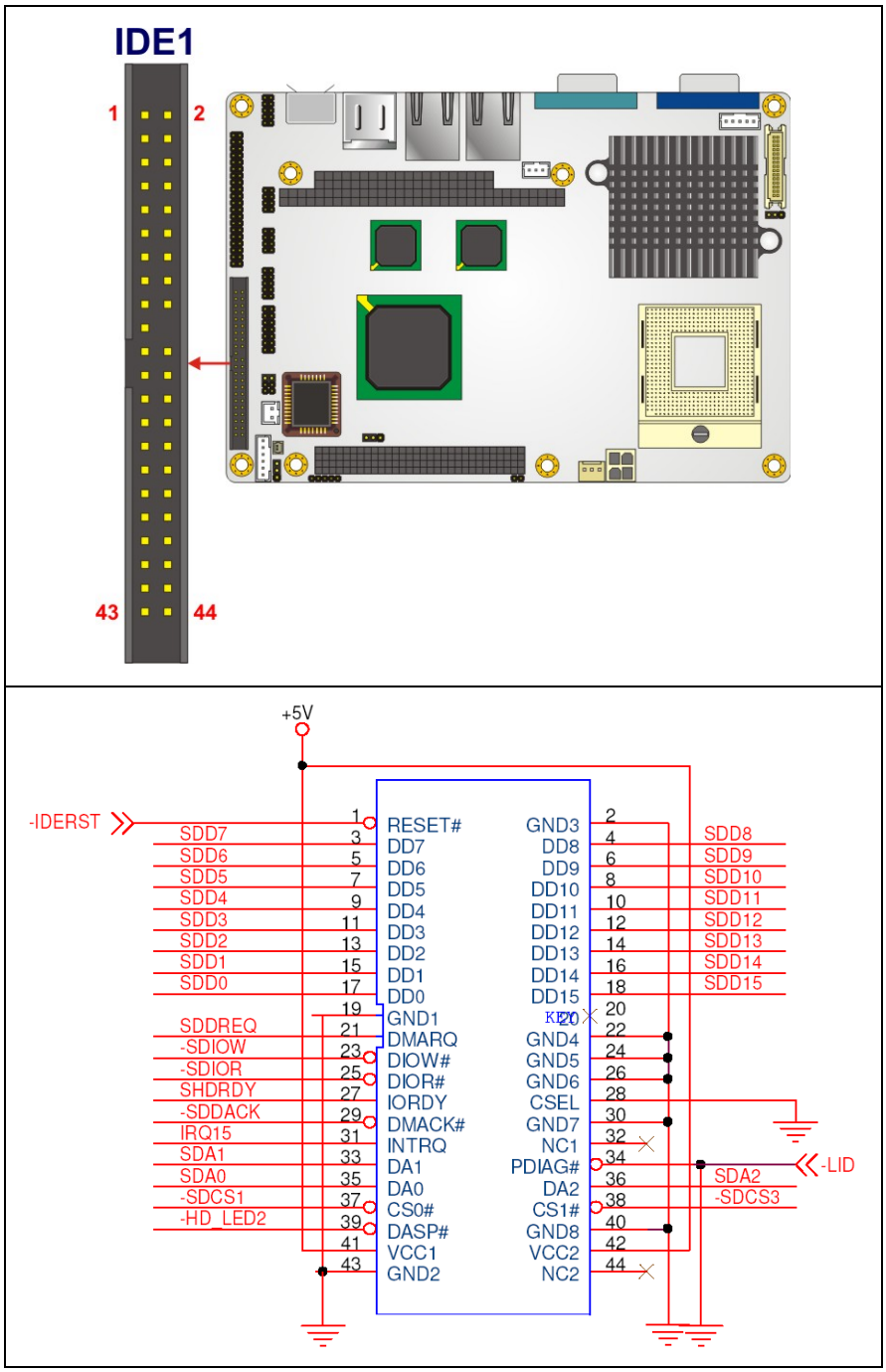


Figure 4-11: IDE Device Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RESET#	2	GND
3	PDD7	4	PDD8

PIN	DESCRIPTION	PIN	DESCRIPTION
5	PDD6	6	PDD9
7	PDD5	8	PDD10
9	PDD4	10	PDD11
11	PDD3	12	PDD12
13	PDD2	14	PDD13
15	PDD1	16	PDD14
17	PDD0	18	PDD15
19	GND	20	N/C
21	PDREQ	22	GND
23	PDIOW#	24	GND
25	PDIOR#	26	GND
27	PIORDY	28	CSEL
29	PDDACK#	30	GND
31	IRQ_14	32	N/C
33	PDA1	34	P66DET
35	PDA0	36	PDA2
37	PDCS#1	38	PDCS#3
39	IDEACTP#	40	GND
41	VCC5	42	VCC5
43	GND	44	N/C

Table 4-11: IDE Connector Pinouts

4.2.10 Infrared Interface Connector (5-pin)

CN Label: IR1

CN Type: 5-pin header (1x5)

CN Location: See **Figure 4-12**

CN Pinouts: See **Table 4-12**

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

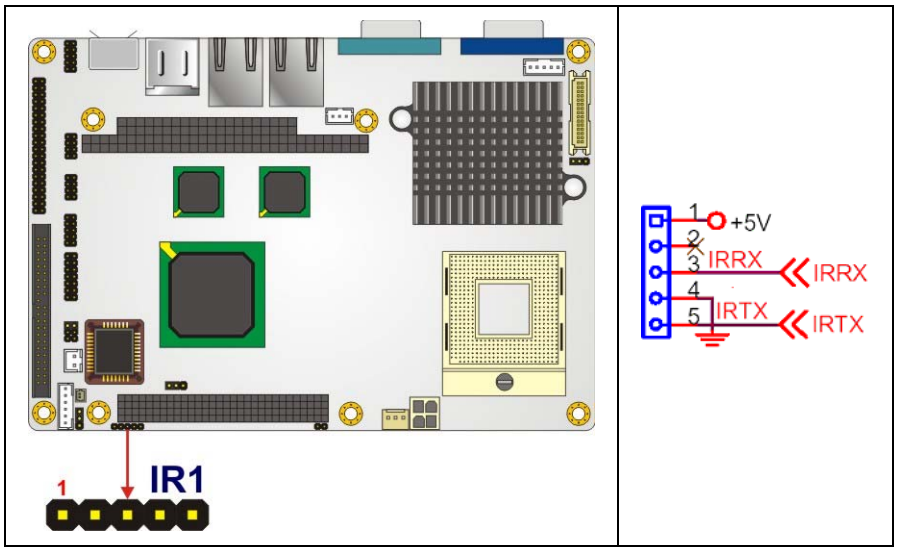


Figure 4-12: Infrared Connector Pinout Locations

PIN	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 4-12: Infrared Connector Pinouts

4.2.11 Inverter Connector

CN Label: INV1

CN Type: 5-pin wafer (1x5)

CN Location: See **Figure 4-13**

CN Pinouts: See **Table 4-13**

The backlight inverter connector provides the backlight on the LCD display connected to the NANO-4386A with +12V of power.

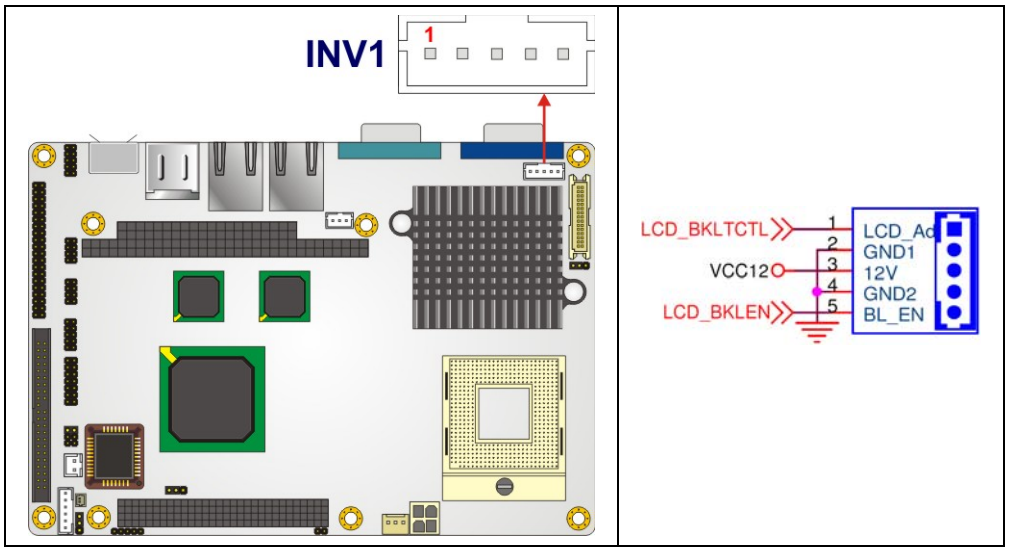


Figure 4-13: Inverter Connector Location

PIN	DESCRIPTION
1	BRIGHTNESS
2	GND
3	VCC12
4	GND
5	ENABLE BACKLIGHT

Table 4-13: Inverter Connector Pinouts

4.2.12 LVDS Connector

CN Label: **LVDS1**

CN Type: 30-pin crimp connector

CN Location: See **Figure 4-14**

CN Pinouts: See **Table 4-14**

The 30-pin LVDS LCD connector can be connected to single channel or dual channel, 18-bit or 36-bit LVDS panel.

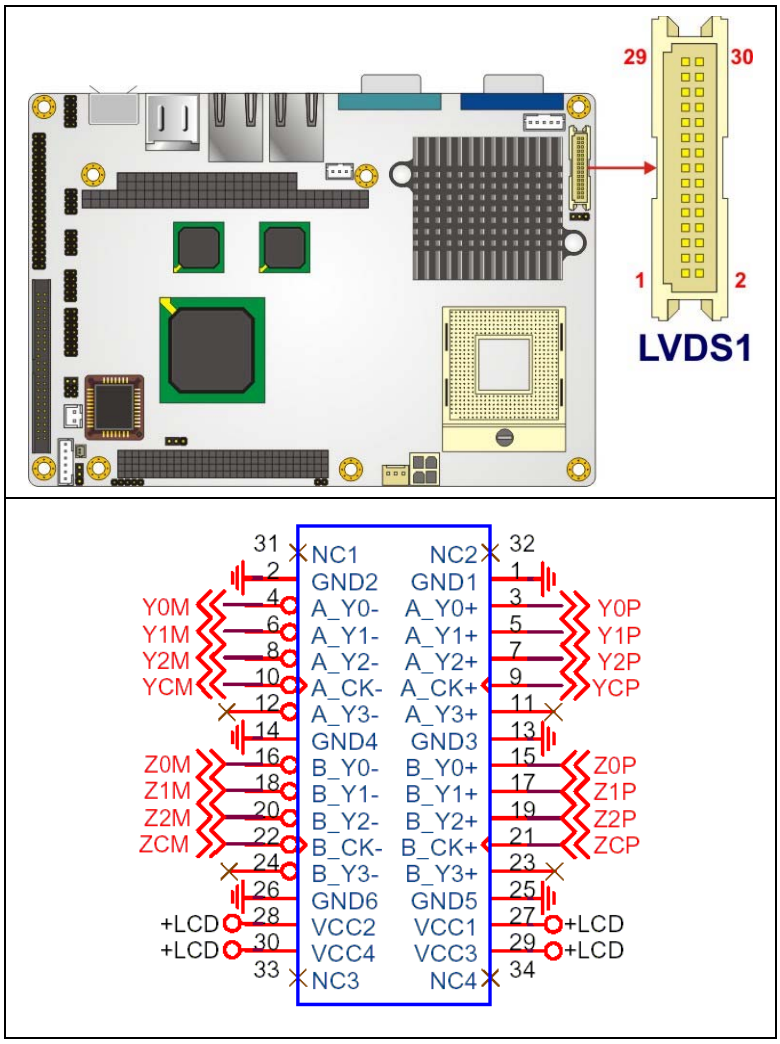


Figure 4-14: LVDS Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GROUND	2	GROUND
3	LVDSA_Y0+	4	LVDSA_Y0-
5	LVDSA_Y1+	6	LVDSA_Y1-
7	LVDSA_Y2+	8	LVDSA_Y2-
9	LVDSA_CLK+	10	LVDSA_CLK-
11	N/C	12	N/C
13	GROUND	14	GROUND
15	LVDSB_Y0+	16	LVDSB_Y0-
17	LVDSB_Y1+	18	LVDSB_Y1-

PIN	DESCRIPTION	PIN	DESCRIPTION
19	LVDSB_Y2+	20	LVDSB_Y2-
21	LVDSB_CLK+	22	LVDSB_CLK-
23	N/C	24	N/C
25	GROUND	26	GROUND
27	VCC_LVDS	28	VCC_LVDS
29	VCC_LVDS	30	VCC_LVDS

Table 4-14: LVDS Connector Pinouts

4.2.13 PC/104 Connector

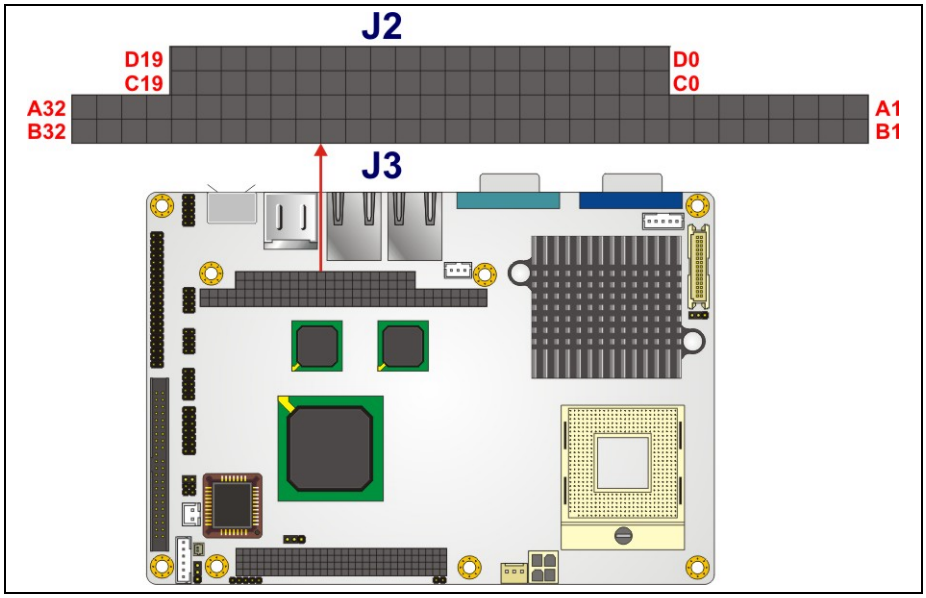
CN Label: J2, J3

CN Type: J2: 40-pin PC/104 socket
J3: 64-pin PC/104 socket

CN Location: See **Figure 4-15**

CN Pinouts: See **Table 4-15**

The PC/104 slot enables a PC/104 compatible expansion module to be connected to the board.



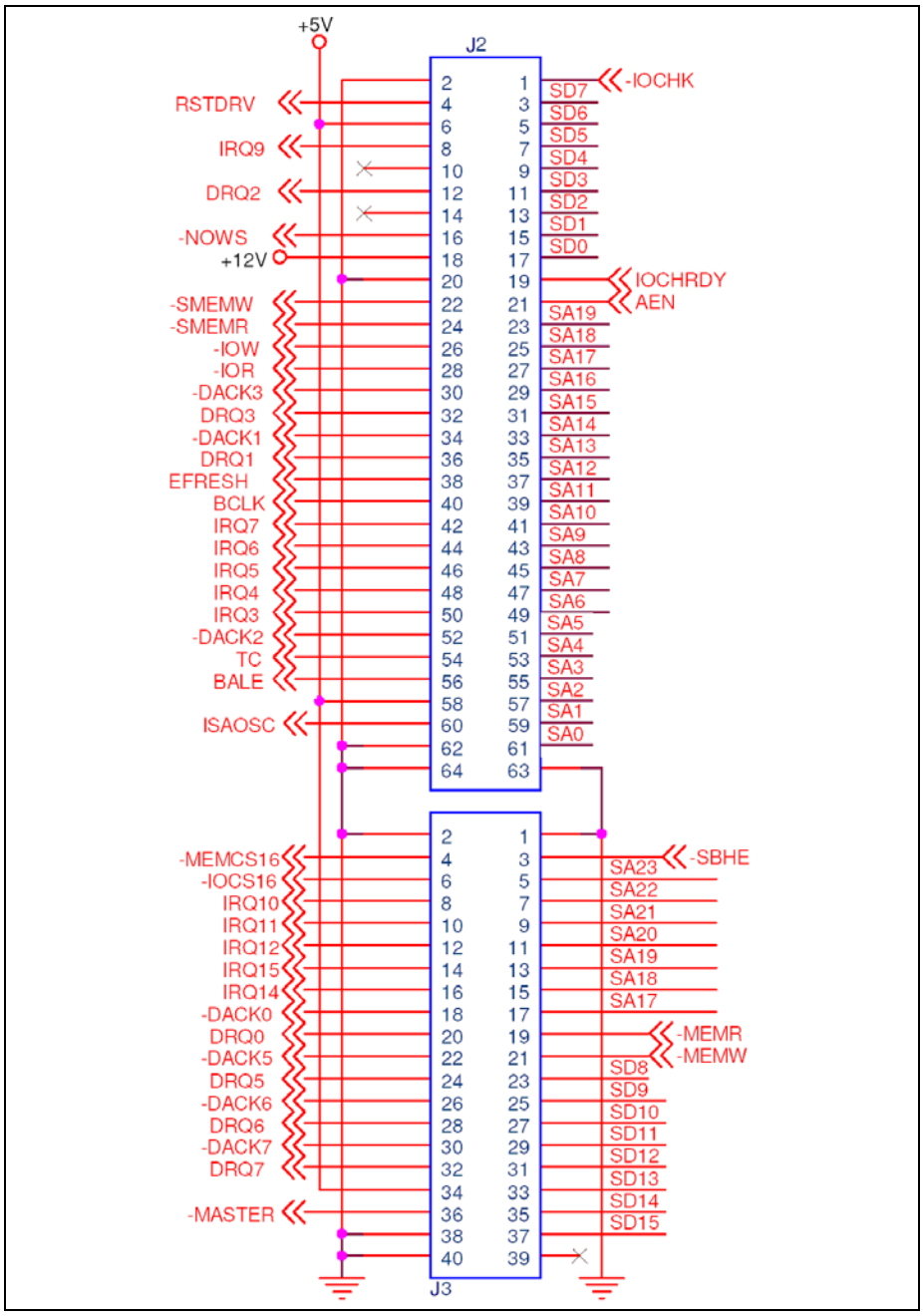


Figure 4-15: PC/104 Connector Pinout Locations

Pin	Column A	Column B	Column C	Column D
1	IOCHK-	GROUND	GROUND	GROUND
2	SD7	RSTDRV	SBHE-	MCS16-
3	SD6	+5V	SA23	IOCS16-

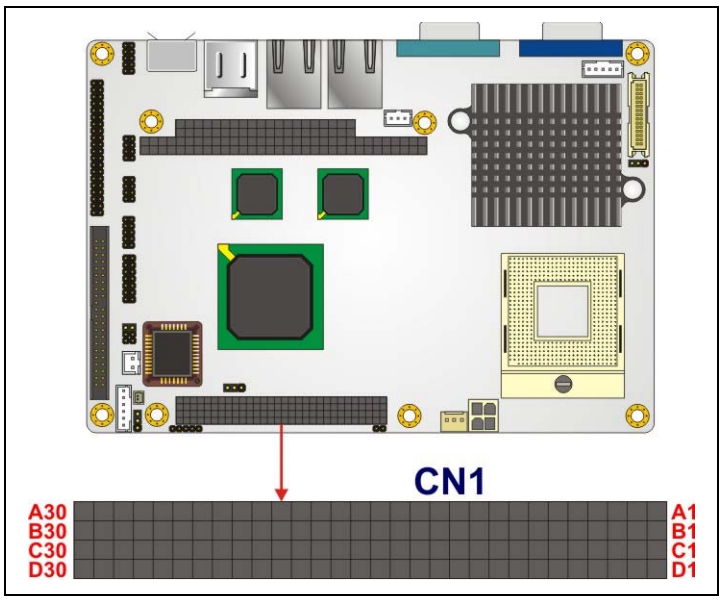
Pin	Column A	Column B	Column C	Column D
4	SD5	IRQ9	SA22	IRQ10
5	SD4	-5V	SA21	IRQ11
6	SD3	DREQ2	SA20	IRQ12
7	SD2	-12V	SA19	IRQ15
8	SD1	ZWS-	SA18	IRQ14
9	SD0	+12V	SA17	DACK0-
10	IOCHRDY	GROUND	MEMR-	DREQ0
11	AEN	SMEMW-	MEMW-	DACK5-
12	SA19	SMEMR-	SD8	DRREQ5
13	SA18	IOW-	SD9	DACK6-
14	SA17	IOR-	SD10	DREQ6
15	SA16	DACK3-	SD11	DACK7-
16	SA15	DREQ3	SD12	DREQ7
17	SA14	DACK1-	SD13	+5V
18	SA13	DREQ1	SD14	MASTER-
19	SA12	REFRESH-	SD15	GROUND
20	SA11	ISACLK	NC	GROUND
21	SA10	IRQ7		
22	SA9	IRQ6		
23	SA8	IRQ5		
24	SA7	IRQ4		
25	SA6	IRQ3		
26	SA5	DACK2-		
27	SA4	TC		
28	SA3	BALE		
29	SA2	+5V		
30	SA1	ISA_OSC		
31	SA0	GROUND		
32	GROUND	GROUND		

Table 4-15: PC/104 Connector Pinouts

4.2.14 PCI-104 Connector

CN Label:	**CN1**
CN Type:	120-pin PCI-104 socket (4x30)
CN Location:	See **Figure 4-16**
CN Pinouts:	See **Table 4-16**

The PCI-104 socket enables a PCI-104 compatible expansion module to be connected to the board.



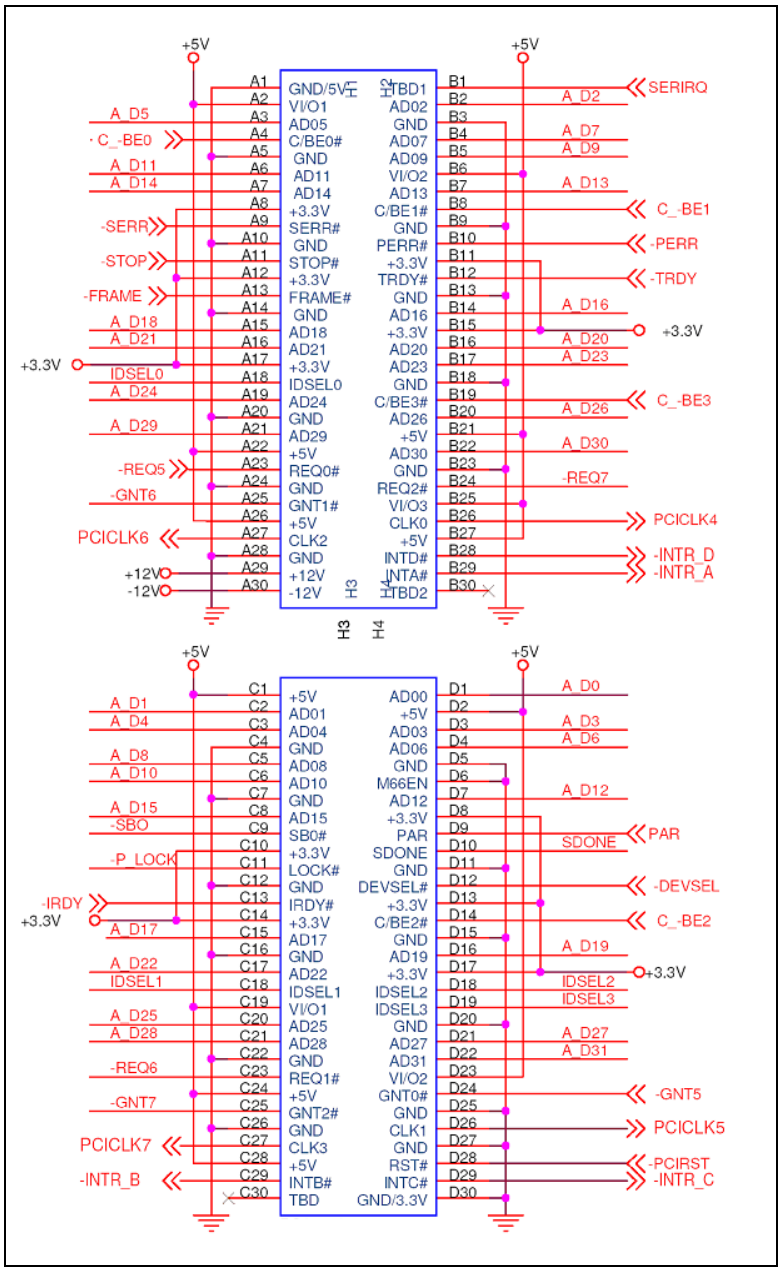


Figure 4-16: PCI-104 Connector Location

Pin	Column A	Column B	Column C	Column D
1	GND/5V	TBD1	5V	AD00
2	VI/O1	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0#	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O2	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1#	AD15	+3.3V
9	SERR#	GND	SB0#	PAR
10	GND	PERR#	+3.3V	SDONE
11	STOP#	+3.3V	LOCK#	GND
12	+3.3V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3V
14	GND	AD16	+3.3V	C/BE2#
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O1	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0#	GND	REQ1#	VI/O2
24	GND	REQ2#	+5V	GNT0#
25	GNT1#	VI/O3	GNT2#	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD#	+5V	RST#
29	+12V	INTA#	INTB#	INTC#
30	-12V	TBD2	TBD	GND/3.3V

Table 4-16: PCI-104 Connector Pinouts

4.2.15 Power On Connector

CN Label: PWRON1

CN Type: 2-pin wafer

CN Location: See **Figure 4-17**

CN Pinouts: See **Table 4-17**

The power on connector is connected to a power switch on the system chassis to enable users to turn the system on and off.

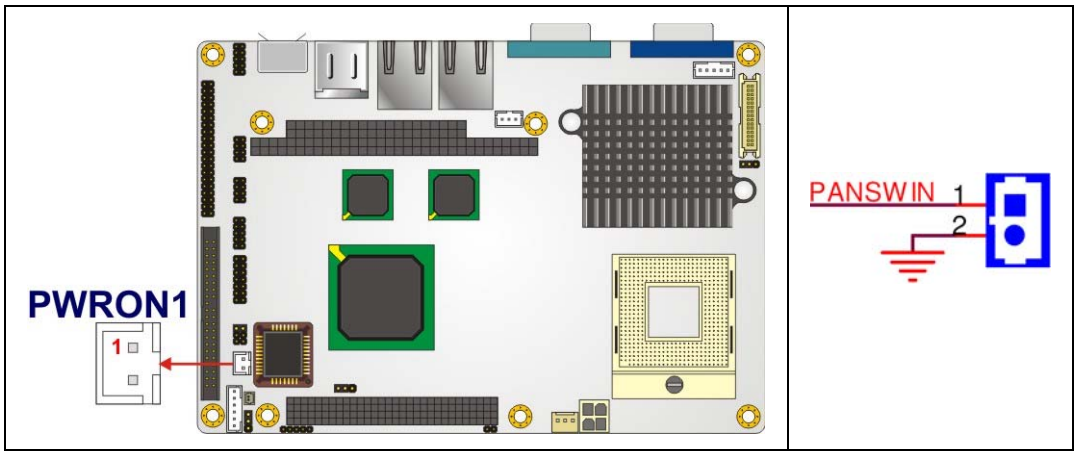


Figure 4-17: Power On Connector Location

PIN	DESCRIPTION
1	Power Switch
2	GND

Table 4-17: Power On Connector Pinouts

4.2.16 Serial Port Connector (RS-232)

CN Label: COM3

CN Type: 40-pin box header (2x20)

CN Location: See **Figure 4-18**

CN Pinouts: See **Table 4-18**

The 40-pin serial port connector provides RS-232 serial communications channels to 4 COM ports (COM3, COM4, COM5 and COM6) that can be connected to external RS-232 serial port devices. The serial port locations are specified below.

- COM 3 is located from pin 1 to pin 10
- COM 4 is located from pin 11 to pin 20
- COM 5 is located from pin 21 to pin 30
- COM 6 is located from pin 31 to pin 40

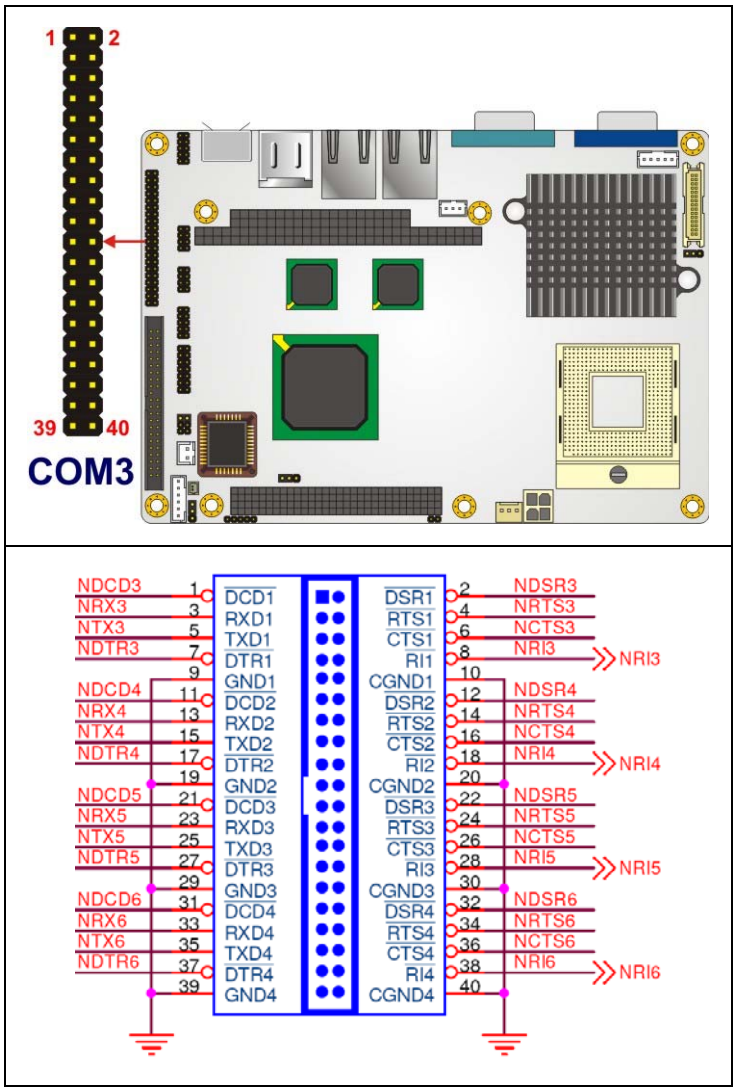


Figure 4-18: Serial Port Connector (RS-232) Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	NDCD3	2	NDSR3
3	NRX3	4	NRTS3
5	NTX3	6	NCTS3
7	NDTR3	8	NRI3
9	GND	10	GND
11	NDCD4	12	NDSR4
13	NRX4	14	NRTS4
15	NTX4	16	NCTS4
17	NDTR4	18	NRI4
19	GND	20	GND
21	NDCD5	22	NDSR5
23	NRX5	24	NRTS5
25	NTX5	26	NCTS5
27	NDTR5	28	NRI5
29	GND	30	GND
31	NDCD6	32	NDSR6
33	NRX6	34	NRTS6
35	NTX6	36	NCTS6
37	NDTR6	38	NRI6
39	GND	40	GND

Table 4-18: Serial Port Connector (RS-232) Pinouts

4.2.17 Serial Port Connector (RS-232/422/485)

CN Label: COM2

CN Type: 14-pin header (2x7)

CN Location: See **Figure 4-19**

CN Pinouts: See **Table 4-19**

The 14-pin serial port connector provides an RS-232/422/485 serial communications channel that can be connected to external RS-232/422/485 serial port devices. The signal type is controlled via the JP2 jumper.

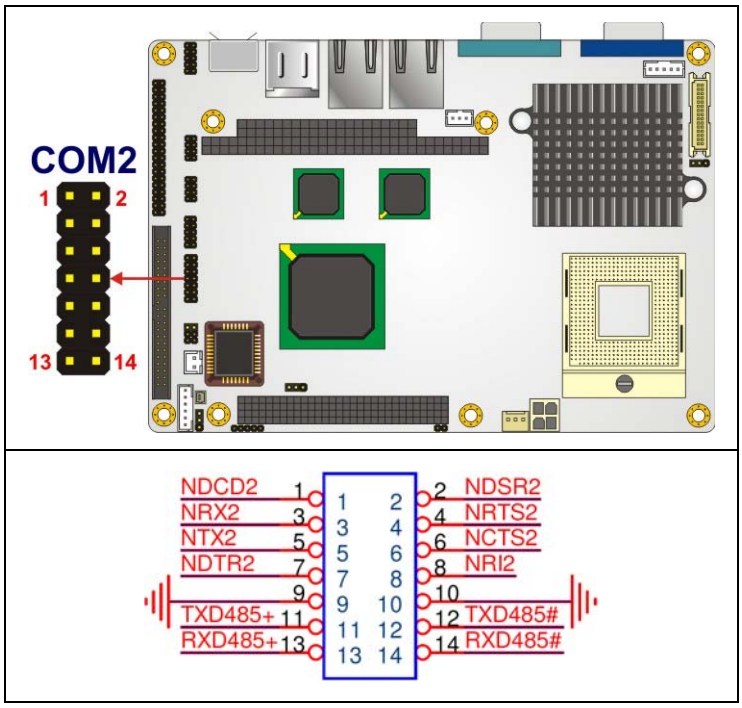


Figure 4-19: Serial Port Connector (RS-232/422/485) Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	GND
11	TXD1+	12	TXD1-
13	RXD1+	14	RXD1-

Table 4-19: Serial Port Connector (RS-232/422/485) Pinouts

4.2.18 SO-DIMM Socket

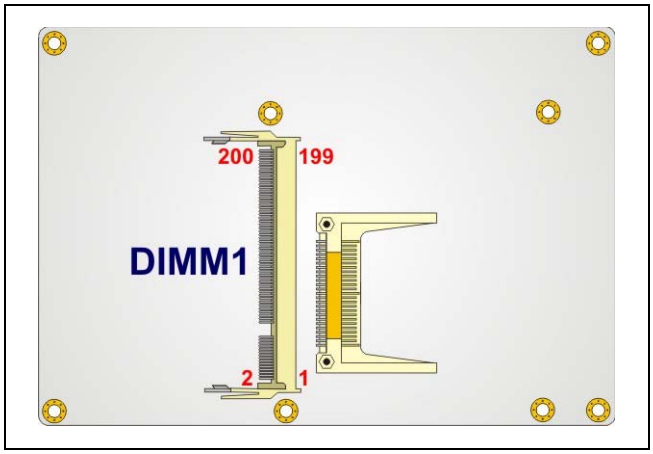
CN Label: DIMM1

CN Type: 200-pin SO-DIMM socket

CN Location: See **Figure 4-20**

CN Pinouts: See **Table 4-20**

The 200-pin DDR SO-DIMM socket receives a DDR 266MHz SO-DIMM module.



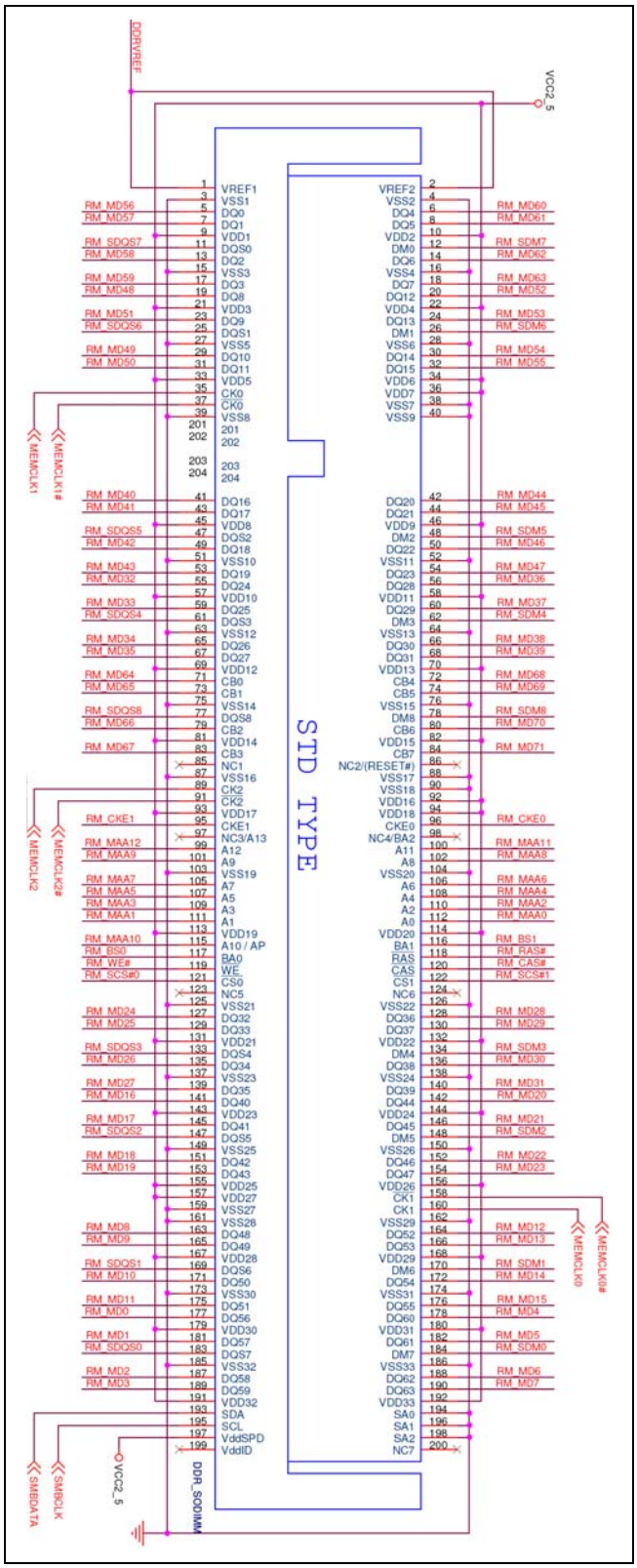


Figure 4-20: SO-DIMM Socket Location

Pin	Front	Pin	Back	Pin	Front	Pin	Back
1	VREF	2	VREF	101	A9	102	A8
3	VSS	4	VSS	103	VSS	104	VSS
5	DQ0	6	DQ4	105	A7	106	A6
7	DQ1	8	DQ5	107	A5	108	A4
9	VDD	10	VDD	109	A3	110	A2
11	DQS0	12	DM0\DQS9	111	A1	112	A0
13	DQ2	14	DQ6	113	VDD	114	VDD
15	VSS	16	VSS	115	A10\AP	116	BA1
17	DQ3	18	DQ7	117	BA0	118	/RAS
19	DQ8	20	DQ12	119	/WE	120	/CAS
21	VDD	22	VDD	121	/S0	122	/S1
23	DQ9	24	DQ13	123	DU(A13)	124	DU(BA2)
25	DQS1	26	DM1\DQS10	125	VSS	126	VSS
27	VSS	28	VSS	127	DQ32	128	DQ36
29	DQ10	30	DQ14	129	DQ33	130	DQ37
31	DQ11	32	DQ15	131	VDD	132	VDD
33	VDD	34	VDD	133	DQS4	134	DM4\DQS13
35	CK0	36	VDD	135	DQ34	136	DQ38
37	/CK0	38	VSS	137	VSS	138	VSS
39	VSS	40	VSS	139	DQ35	140	DQ39
41	DQ16	42	DQ20	141	DQ40	142	DQ44
43	DQ17	44	DQ21	143	VDD	144	VDD
45	VDD	46	VDD	145	DQ41	146	DQ45
47	DQS2	48	DM2\DQS11	147	DQS5	148	DM5\DQS14
49	DQ18	50	DQ22	149	VSS	150	VSS
51	VSS	52	VSS	151	DQ42	152	DQ46
53	DQ19	54	DQ23	153	DQ43	154	DQ47
55	DQ24	56	DQ28	155	VDD	156	VDD
57	VDD	58	VDD	157	VDD	158	/CK1
59	DQ25	60	DQ29	159	VSS	160	CK1
61	DQS3	62	DM3\DQS12	161	VSS	162	VSS

Pin	Front	Pin	Back	Pin	Front	Pin	Back
63	VSS	64	VSS	163	DQ48	164	DQ52
65	DQ26	66	DQ30	165	DQ49	166	DQ53
67	DQ27	68	DQ31	167	VDD	168	VDD
69	VDD	70	VDD	169	DQS6	170	DM6\DQS15
71	CB0*	72	CB4*	171	DQ50	172	DQ54
73	CB1*	74	CB5*	173	VSS	174	VSS
75	VSS	76	VSS	175	DQ51	176	DQ55
77	DQS8*	78	DM8\DQS17*	177	DQ56	178	DQ60
79	CB2*	80	CB6*	179	VDD	180	VDD
81	VDD	82	VDD	181	DQ57	182	DQ61
83	CB3*	84	CB7*	183	DQS7	184	DM7\DQS16
85	DU	86	DU(/RESET)	185	VSS	186	VSS
87	VSS	88	VSS	187	DQ58	188	DQ62
89	CK2*	90	VSS	189	DQ59	190	DQ63
91	/CK2*	92	VDD	191	VDD	192	VDD
93	VDD	94	VDD	193	SDA	194	SA0
95	CKE1	96	CKE0	195	SCL	196	SA1
97	DU	98	DU	197	VDDSPD	198	SA2
99	A12	100	A11	199	VDDID*	200	DU

Table 4-20: SO-DIMM Socket Pinouts

4.2.19 USB Connectors (Internal)

CN Label: USB2, USB3

CN Type: 8-pin header (2x4)

CN Location: See **Figure 4-21**

CN Pinouts: See **Table 4-21**

The USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

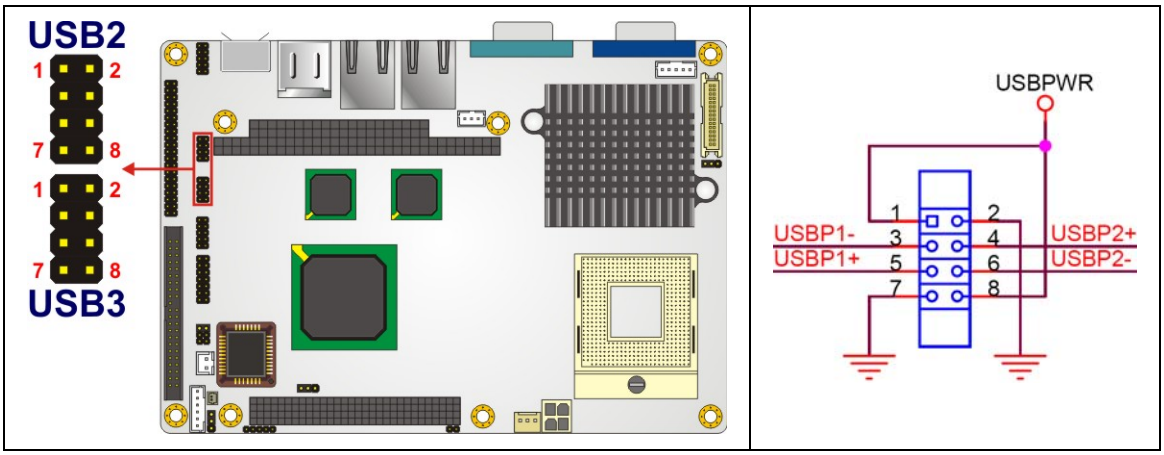


Figure 4-21: USB Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	PWR (+5V)	2	GND
3	USBPA-	4	USBPB+
5	USBPA+	6	USBPB-
7	GND	8	PWR (+5V)

Table 4-21: USB Port Connector Pinouts

4.3 External Peripheral Interface Connectors

Figure 4-22 shows the NANO-4386A external peripheral connector panel. The peripheral connectors on the panel can be connected to devices externally when the motherboard is installed in a chassis. The external peripheral connectors are:

- 1 x VGA connector (labeled 1)
- 1 x Serial port connector (labeled 2)
- 2 x RJ-45 GbE connectors (labeled 3 and 4)
- 2 x USB 2.0 ports (labeled 5)
- 1 x Keyboard/Mouse connector (labeled 6)

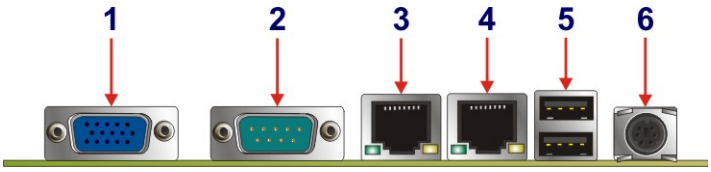


Figure 4-22: NANO-4386A External Peripheral Connector Panel

4.3.1 VGA Connector

CN Label: VGA1

CN Type: HD-D-sub 15 Female connector

CN Location: See **Figure 4-22** (labeled 1)

CN Pinouts: See **Figure 4-23** and **Table 4-22**

The standard HD-D-sub 15 female connector connects to a CRT or LCD monitor.

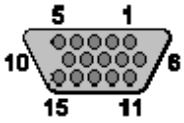


Figure 4-23: VGA Connector

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

Table 4-22: VGA Connector Pinouts

4.3.2 Serial Communications Connector

CN Label:	COM1
CN Type:	D-sub 9 Male connector
CN Location:	See **Figure 4-22** (labeled 2)
CN Pinouts:	See **Figure 4-24** and **Table 4-23**

The serial connector on the external interface panel provides serial connection in the RS-232 mode.

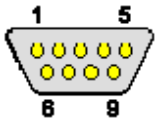


Figure 4-24: Serial Communications Connector Pinout Locations

PIN	DESCRIPTION
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

Table 4-23: COM1 RS-232 Mode Connector Pinouts

4.3.3 Ethernet Connector

CN Label: LAN1 and LAN2

CN Type: RJ-45 ports

CN Location: See **Figure 4-22** (labeled 3 and 4)

CN Pinouts: See **Table 4-24** and **Table 4-25**

A 1Gb connection can be made between the Ethernet connectors and a Local Area Network (LAN) through a network hub.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX+ (or MDX0+)	5	N/C (or MDX2-)
2	TX- (or MDX0-)	6	RX- (or MDX1-)
3	RX+ (or MDX1+)	7	N/C (or MDX3+)
4	N/C (or MDX2+)	8	N/C (or MDX3-)
13	MDX0+	17	MDX2-
14	MDX0-	18	MDX1-
15	MDX1+	19	MDX3+
16	MDX2+	20	MDX3-
1	TX+ (or MDX0+)	5	N/C (or MDX2-)
2	TX- (or MDX0-)	6	RX- (or MDX1-)

Table 4-24: Ethernet Connector Pinouts

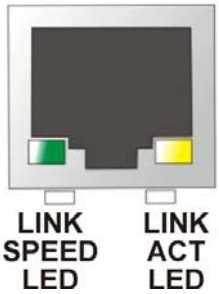


Figure 4-25: Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked (**Table 4-25**).

SPEED LED		LINK LED	
Status	**Description**	**Status**	**Description**
GREEN	ON: 100MB OFF: 10MB	YELLOW	ON: Linked Flashing: Activity

Table 4-25: Ethernet Connector LEDs

4.3.4 USB Connectors

CN Label: USB1

CN Type: Dual USB port

CN Location: See **Figure 4-22** (labeled 5)

CN Pinouts: See **Table 4-26**

USB devices connect directly to the USB connectors on the external peripheral connector panel.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	5	VCC
2	USBD0-	6	USBD0-
3	USBD0+	7	USBD0+
4	GND	8	GND

Table 4-26: USB Connector Pinouts

4.3.5 Keyboard/Mouse Connector

CN Label:	KB/PS1
CN Type:	PS/2
CN Location:	See **Figure 4-22** (labeled 6)
CN Pinouts:	See **Figure 4-26** and **Table 4-27**

The NANO-4386A keyboard and mouse connector is a standard PS/2 connector.

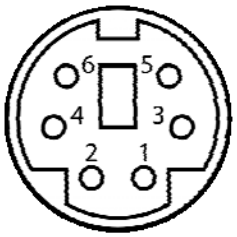


Figure 4-26: PS/2 Pinout and Configuration

PIN	DESCRIPTION
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

Table 4-27: Keyboard Connector Pinouts

4.4 On-board Jumpers

The NANO-4386A has fifteen on-board jumpers. Refer to **Section 5.4** for jumper configuration settings.

Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the NANO-4386A may result in permanent damage to the NANO-4386A and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the NANO-4386A. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the NANO-4386A, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the NANO-4386A, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the PCB***: When handling the PCB, hold it by its edges.

5.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the NANO-4386A is installed. All installation notices pertaining to the installation of the NANO-4386A should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the NANO-4386A and injury to the person installing the motherboard.

5.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the NANO-4386A and injury to the user.

Before and during the installation please DO the following:

- **Read the user manual**:
  - The user manual provides a complete description of the NANO-4386A installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD)**:
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place the NANO-4386A on an antistatic pad**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn off all power to the NANO-4386A**:

- When working with the NANO-4386A, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the NANO-4386A **DO NOT**:

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2.2 Installation Checklist

The following checklist is provided to ensure the NANO-4386A is properly installed.

- All the items in the packing list are present (see **Chapter 3**)
- A CPU is installed
- A CPU cooling kit is properly installed
- Compatible memory modules are properly inserted into the memory slots
- The NANO-4386A is installed into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices (if applicable) are properly connected
  - IDE devices
  - SATA drives
  - Floppy disk drive
  - System front panel connector
  - Audio kit
  - Power supply
  - USB cable
  - Serial port cable
  - Parallel port cable
  - Keyboard/mouse cable
  - COM port cables
- The following external peripheral devices (if applicable) are properly connected to the chassis:

- VGA screen
- Keyboard
- Mouse
- USB devices
- LAN
- Audio jacks

5.3 CPU, CPU Cooling Kit and DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the NANO-4386A. If any of these components is not installed, the NANO-4386A cannot operate.

5.3.1 Socket 479 CPU Installation

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket 479 CPU onto the NANO-4386A, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Unlock the CPU retention screw.** When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to unlock the screw. See **Figure 5-1**.

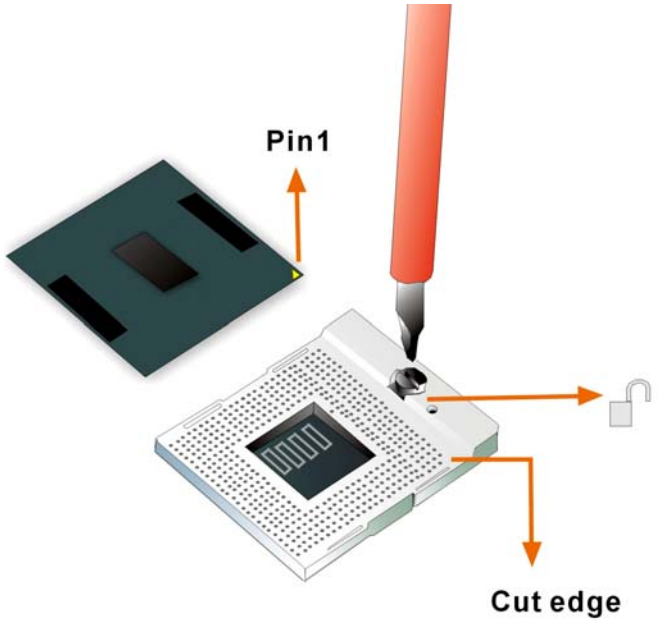


Figure 5-1: Make sure the CPU socket retention screw is unlocked

Step 2: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 3: **Correctly Orientate the CPU**. Make sure the IHS (integrated heat sink) side is facing upwards.

Step 4: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. See **Figure 5-1**.

Step 5: **Align the CPU pins.** Carefully align the CPU pins with the holes in the CPU socket.

Step 6: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.

Step 7: **Lock the retention screw.** Rotate the retention screw into the locked position. See **Figure 5-2**.

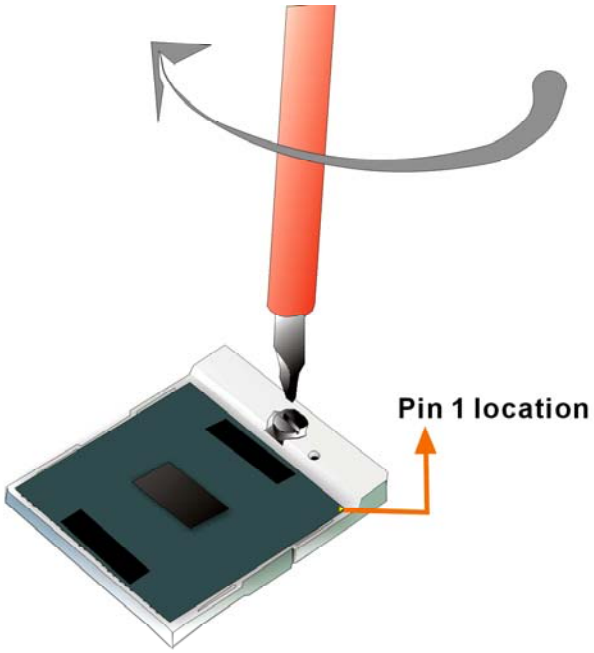


Figure 5-2: Lock the CPU Socket Retention Screw

5.3.2 Cooling Kit CF-479B-RS Installation

Figure 5-3: IEI CF-479B-RS Cooling Kit

An IEI Socket 479 CPU cooling kit (**Figure 5-3**) can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the [Fan model#] heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the CF-479B-RS cooling kit, please follow the steps below.

Step 1: **Place the cooling kit onto the CPU**. Make sure the CPU cooling fan cable can be properly routed when the cooling kit is installed.

Step 2: **Properly align the cooling kit**. Make sure its four spring screw fasteners can pass through the pre-drilled holes on the PCB.

Step 3: **Secure the cooling kit**. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 5-4**)

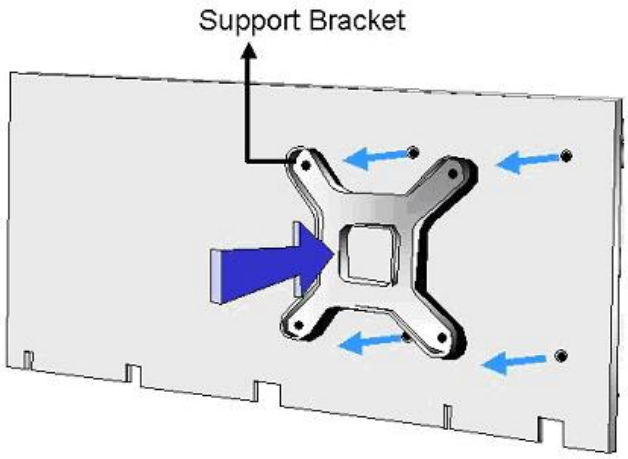


Figure 5-4: Cooling Kit Support Bracket

Step 4: **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 5: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the motherboard. Carefully route the cable and avoid heat generating chips and fan blades. See **Figure 5-5**.

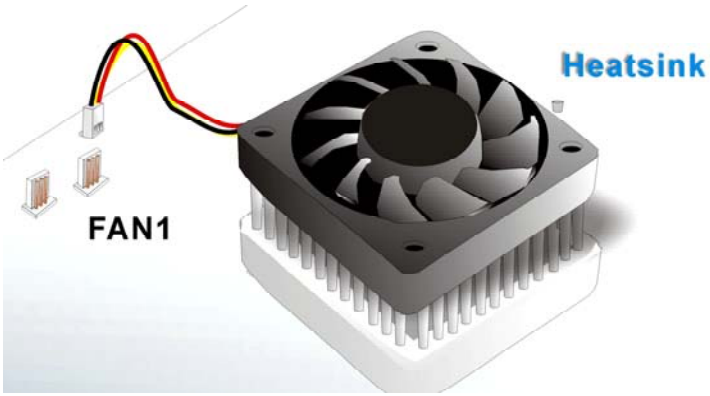


Figure 5-5: Connect the cooling fan cable

5.3.3 SO-DIMM Installation

WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the NANO-4386A. Please make sure the purchased SO-DIMM complies with the memory specifications of the NANO-4386A. SO-DIMM specifications compliant with the NANO-4386A are listed in **Chapter 2**.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below and refer to **Figure 5-6**.

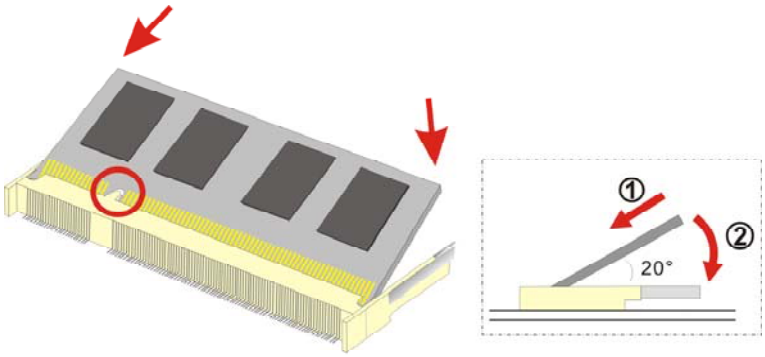


Figure 5-6: SO-DIMM Installation

Step 1: **Locate the SO-DIMM socket**. Place the NANO-4386A on an anti-static pad with the solder side facing up.

Step 2: **Align the SO-DIMM with the socket**. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket.

Step 3: **Insert the SO-DIMM**. Push the SO-DIMM chip into the socket at an angle. (See **Figure 5-6**)

Step 4: **Open the SO-DIMM socket arms**. Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down. (See **Figure 5-6**)

Step 5: **Secure the SO-DIMM**. Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

5.3.4 CF Card Installation

NOTE:

The NANO-4386A can support both CF Type I cards and CF Type II cards. For the complete specifications of the supported CF cards please refer to **Chapter 2**.

To install the a CF card (Type 1 or Type 2) onto the NANO-4386A, please follow the steps below:

Step 1: **Locate the CF card socket**. Place the NANO-4386A on an anti-static pad with the solder side facing up. Locate the CF card.

Step 2: **Align the CF card**. Make sure the CF card is properly aligned with the CF socket.

Step 3: **Insert the CF card**. Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See **Figure 5-7**.

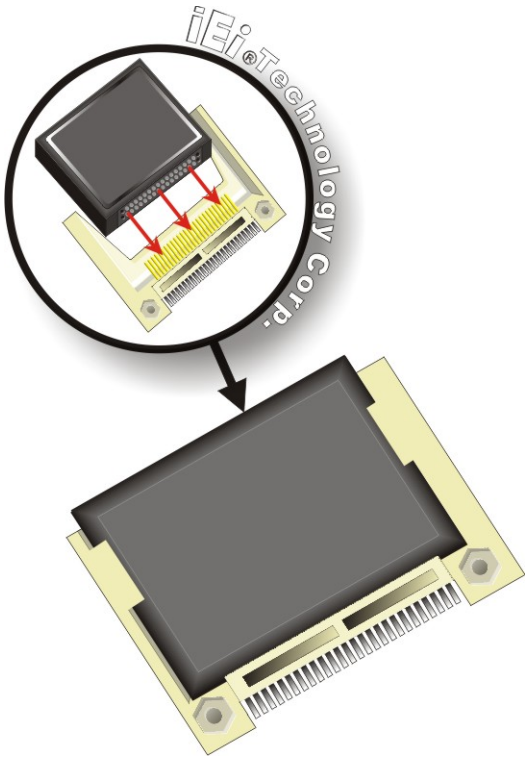


Figure 5-7: CF Card Installation

5.4 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

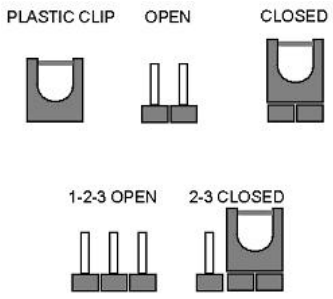


Figure 5-8: Jumpers

Before the NANO-4386A is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the NANO-4386A are listed in **Table 5-1**.

Description	Label	Type
CF Card Setup	JP5	2-pin header
Clear CMOS	JP4	3-pin header
COM2 RS-232/422/485 Setup	JP2	6-pin header
LCD Voltage Setup	JP1	3-pin header
PCI-104 Voltage Setup	JP3	3-pin header

Table 5-1: Jumpers

The NANO-4386A jumper locations are shown in Figure 5-9.

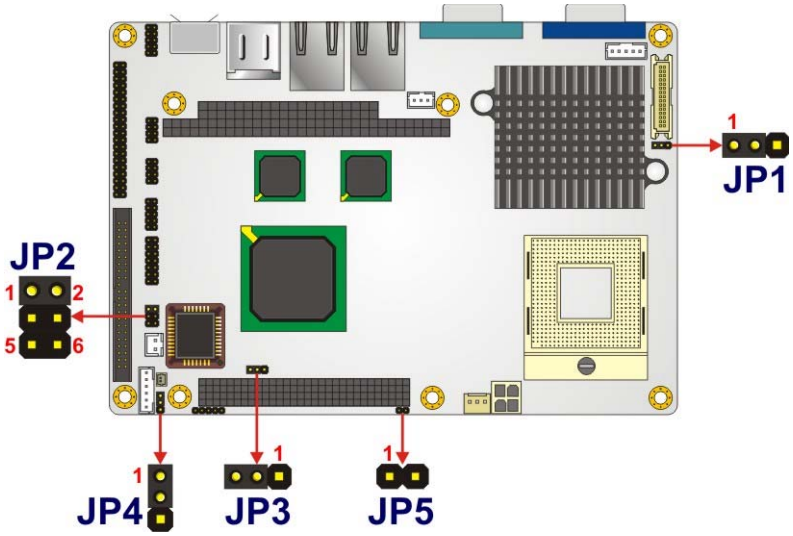


Figure 5-9: Jumper Locations

5.4.1 CF Card Setup

Jumper Label:	**JP5**
Jumper Type:	2-pin header
Jumper Settings:	See **Table 5-2**
Jumper Location:	See Figure 5-9

The CF Card Setup jumper sets the CF Type I card or CF Type II cards as either the slave device or the master device. CF Card Setup jumper settings are shown in **Table 5-2**.

CF Card Setup	Description	
Open	Slave	Default
Short	Master	

Table 5-2: CF Card Setup Jumper Settings

5.4.2 Clear CMOS Jumper

Jumper Label:	**JP4**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 5-3**
Jumper Location:	See Figure 5-9

If the NANO-4386A fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 5-3**.

Clear CMOS	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 5-3: Clear CMOS Jumper Settings

5.4.3 COM2 RS-232/422/485 Setup Jumper

Jumper Label: **JP2**

Jumper Type: 6-pin header

Jumper Settings: See **Table 5-4**

Jumper Location: See Figure 5-9

The COM2 RS-232/422/485 Setup jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM2 RS-232/422/485 Setup settings are shown in **Table 5-4**.

COM2 RS-232/422/485 Setup	Description	
Short 1-2	RS-232	Default
Short 3-4	RS-422	
Short 5-6	RS-485	

Table 5-4: COM2 RS-232/422/485 Setup Jumper Settings

5.4.4 LCD Voltage Setup

WARNING

Permanent damage to the screen and NANO-4386A may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

Jumper Label:	**JP1**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 5-5**
Jumper Location:	See Figure 5-9

The **LCD Voltage Setup** jumper allows the LCD screen voltage to be set. The **LCD Voltage Setup** jumper settings are shown in **Table 5-6**.

LCD Voltage Setup	Description	
Short 1-2	+3.3V	Default
Short 2-3	+5V	

Table 5-5: LCD Voltage Setup Jumper Settings

5.4.5 PCI-104 Voltage Setup

Jumper Label:	**JP3**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 5-6**
Jumper Location:	See Figure 5-9

The **PCI-104 Voltage Setup** jumper allows the PCI signaling voltage to be set. The **PCI-104 Voltage Setup** jumper settings are shown in **Table 5-6**.

PCI-104 Voltage Setup	Description	
Short 1-2	+5V	
Short 2-3	+3.3V	Default

Table 5-6: PCI-104 Voltage Setup Jumper Settings

5.5 Chassis Installation

5.5.1 Airflow

WARNING

Airflow is critical to the cooling of the CPU and other onboard components. The chassis into which the NANO-4386A is placed must have air vents to allow proper airflow to cool the system components.

The NANO-4386A must be installed in a chassis with ventilation holes on the sides allowing airflow to travel over the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow over the board surface.

NOTE

IEI has a wide range of chassis available. Please contact your NANO-4386A vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about available chassis.

5.6 Internal Peripheral Device Connections

5.6.1 Peripheral Device Cables

The cables listed in **Table 5-7** are shipped with the NANO-4386A.

Quantity	Type
1	IDE Flat Cable 44p/44p
1	Audio Cable
1	4 x RS-232 Adapter Cable
1	Power Cable
1	Mini jumper Pack

Table 5-7: IEI Provided Cables

5.6.2 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to an IDE device. Follow the instructions below to connect an IDE HDD to the NANO-4386A.

Step 1: **Locate the IDE connector**. The locations of the IDE device connectors are shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the IDE cable connector to the onboard connector. See **Figure 5-10**. A key on the front of the cable connector ensures it can only be inserted in one direction.

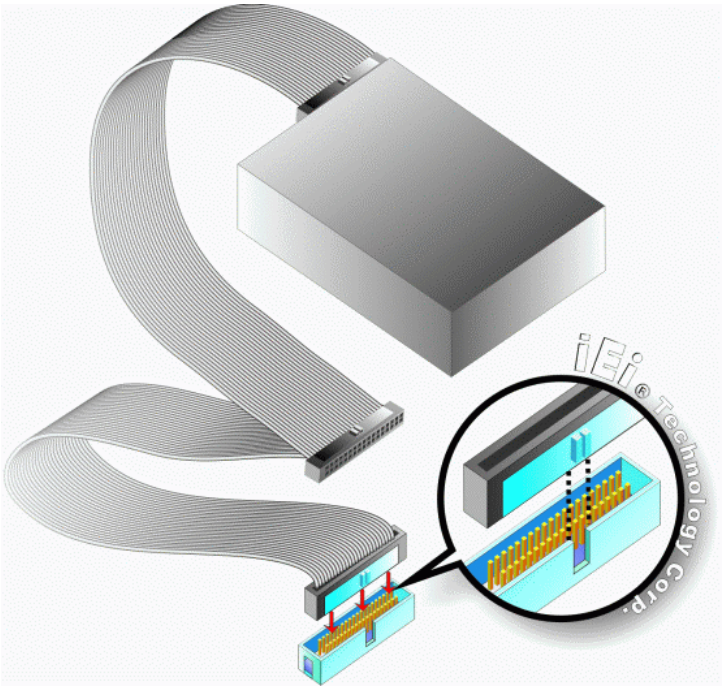


Figure 5-10: IDE Cable Connection

Step 3: **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector.

5.6.3 AT Power Connection

Follow the instructions below to connect the NANO-4386A to an AT power supply.

WARNING:

Disconnect the power supply power cord from its AC power source to prevent a sudden power surge to the NANO-4386A.

Step 1: **Locate the power cable**. The power cable is shown in the packing list in **Chapter 3**.

Step 2: **Connect the Power Cable to the Motherboard**. Connect the 4-pin (2x2) Molex type power cable connector to the AT power connector on the motherboard. See Figure 5-11.

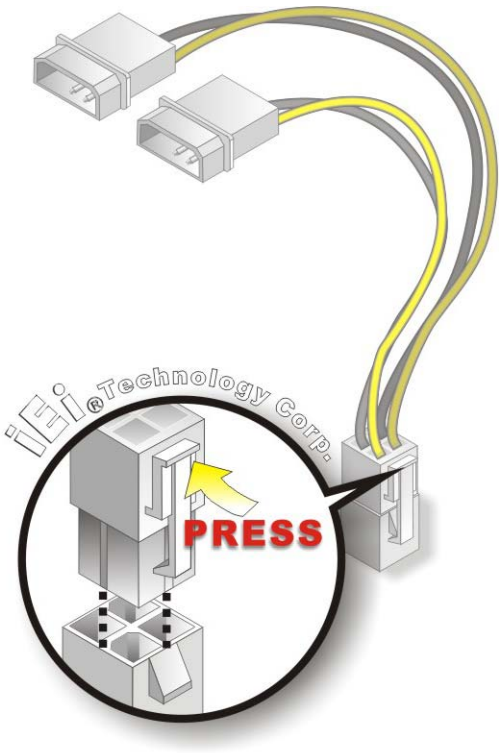


Figure 5-11: Power Cable to Motherboard Connection

Step 3: **Connect Power Cable to Power Supply**. Connect one of the 4-pin (1x4) Molex type power cable connectors to an AT power supply. See Figure 5-12.

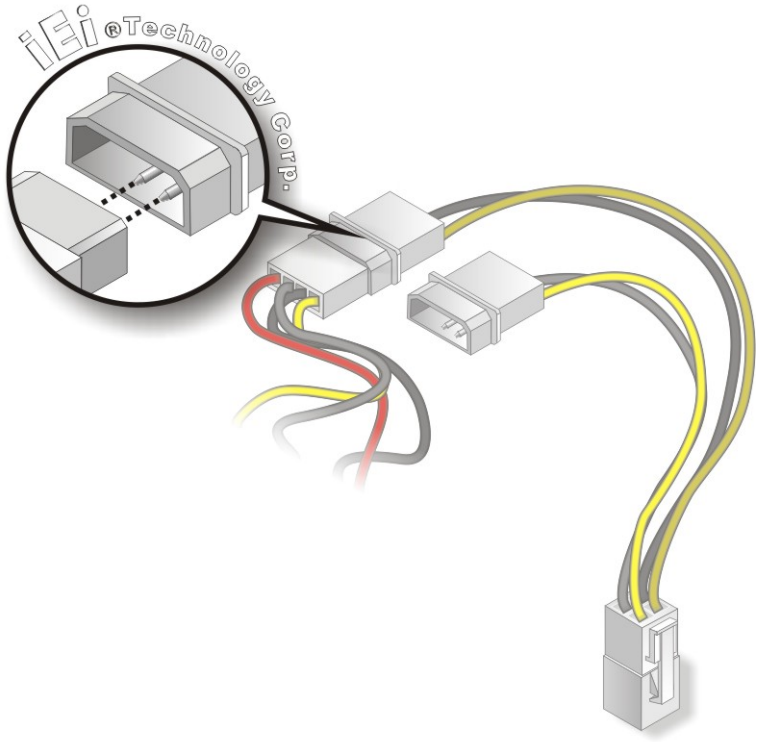


Figure 5-12: Connect Power Cable to Power Supply

5.6.4 ATX Power Connection

Follow the instructions below to connect the NANO-4386A to an ATX power supply.

WARNING:

Disconnect the power supply power cord from its AC power source to prevent a sudden power surge to the NANO-4386A.

Step 1: **Locate the power cable**. The power cable is shown in the packing list in **Chapter 3**.

Step 2: **Connect the Power Cable to the Motherboard**. Connect the 4-pin (2x2) Molex type power cable connector to the AT power connector on the motherboard. See Figure 5-13.

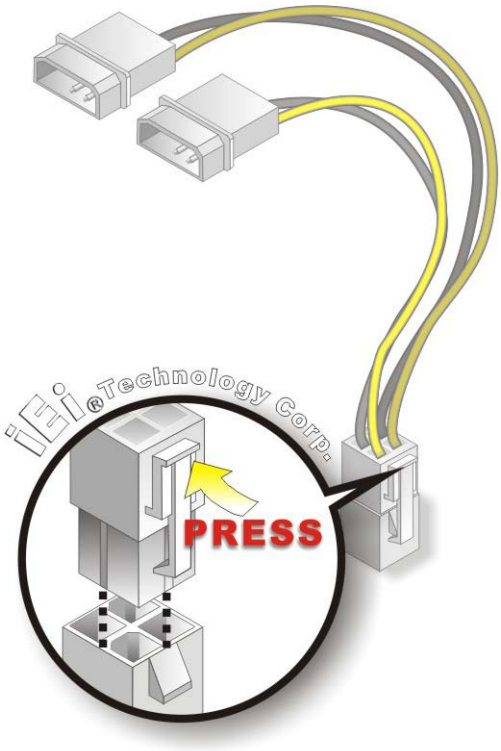


Figure 5-13: Power Cable to Motherboard Connection

Step 3: **Connect the Power Cable to an ATX Power Adapter Cable**. Connect one of the 4-pin (1x4) Molex type power cable connectors to a 20-pin ATX power adapter cable. See Figure 5-14.

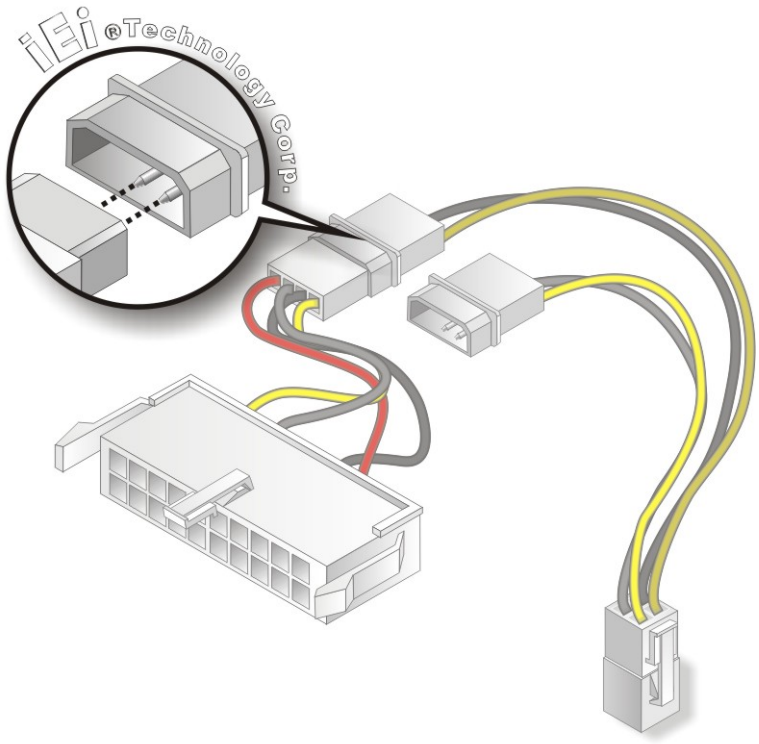


Figure 5-14: Connect Power Cable to ATX Adapter Cable

Step 4: Connect ATX Power Adapter Cable to Power Supply. Connect the 20-pin ATX power adapter cable to an ATX power supply. See Figure 5-15.

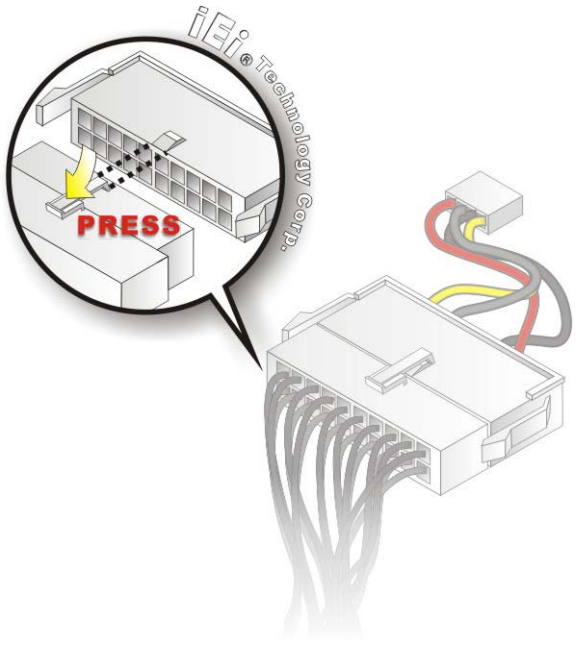


Figure 5-15: Connect ATX Power Adapter Cable to Power Supply

Step 5: **Connect ATX Power Cable to Motherboard**. Connect the 3-pin ATX power connector to the ATX power connector on the motherboard. See Figure 5-16.

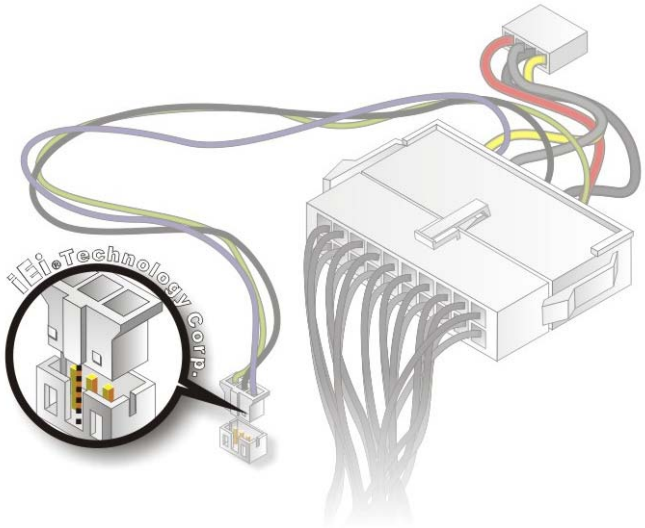


Figure 5-16: Connect ATX Power Cable to Motherboard

5.6.5 Audio Kit Installation

The Audio Kit that came with the NANO-4386A connects to the 10-pin audio connector on the NANO-4386A. The audio kit consists of three audio jacks. One audio jack, Mic In, connects to a microphone. The remaining two audio jacks, Line-In and Line-Out, connect to two speakers. To install the audio kit, please refer to the steps below:

Step 1: **Locate the audio connector**. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 2: **Align pin 1**. Align pin 1 on the onboard connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See **Figure 5-17**.

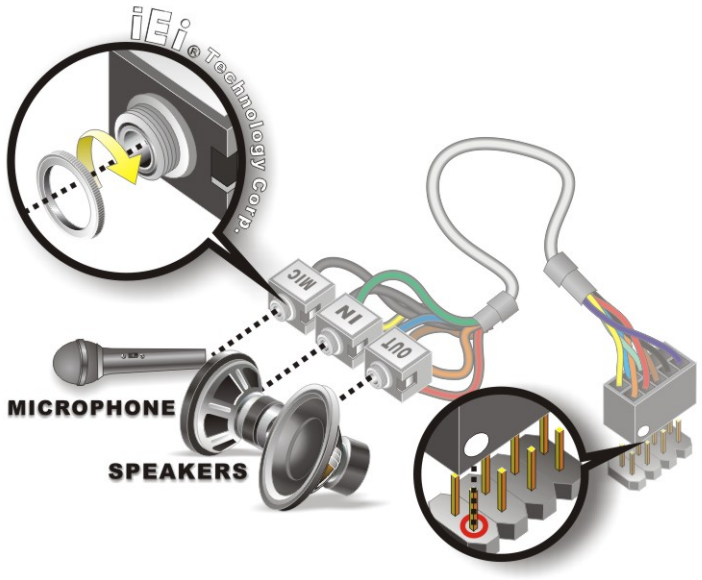


Figure 5-17: Audio Kit Cable Connection

Step 3: **Connect the audio devices**. Connect one speaker to the line-in audio jack, one speaker to the line-out audio jack and a microphone to the mic-in audio jack.

5.6.6 Serial Port Connector Cable (Four Ports) Cable Connection

The NANO-4386A is shipped with one four serial port connector cable. The four serial port connector cable connects four serial port connectors on the cable to the 40-pin serial port connectors on the NANO-4386A. To connect the four serial port connector cable please follow the steps below.

Step 1: **Locate the serial port connector**. The location of the 40-pin serial port connector is shown in **Chapter 3**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the NANO-4386A 40-pin serial port connector. See Figure 5-18.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the 40-pin serial port connector on the NANO-4386A, connect the cable connector to the onboard connectors. See Figure 5-18.

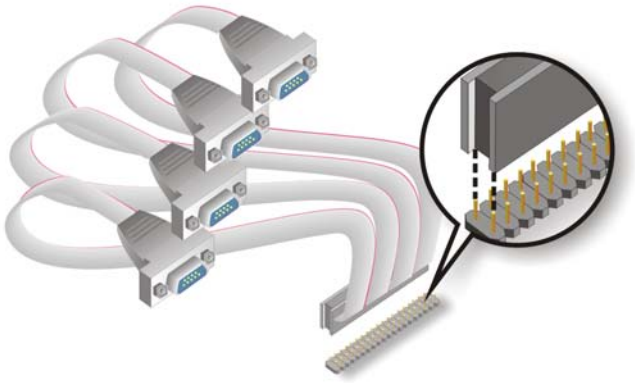


Figure 5-18: Four Serial Port Connector Cable Connection

Step 4: **Attach DB-9 serial port connectors to the chassis**. The four DB-9 serial port connectors can be inserted into four preformed holes in the chassis. Once, inserted the DB-9 connectors should be secured to the chassis with the retention screws.

5.7 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- VGA monitor
- Serial device
- 2 x RJ-45 Ethernet cable connectors
- 2 x USB devices
- Mouse/keyboard

To connect these devices, connect the corresponding cable connector from the actual device to the corresponding NANO-4386A external peripheral interface connector making sure the pins are properly aligned.

5.7.1 PS/2 Keyboard/Mouse Connection

The NANO-4386A has a single PS/2 connector on the external peripheral interface panel. The PS/2 connector is connected to a keyboard or mouse. To connect a keyboard or mouse to the NANO-4386A, please follow the instructions below.

Step 1: **Locate the PS/2 connector**. The location of the PS/2 connector is shown in **Chapter 3**.

Step 2: **Align the PS/2 connector**. Align the PS/2 connector on the keyboard/mouse cable with the PS/2 connector on the external peripheral interface.

Step 3: **Insert the PS/2 connector** Once the connectors are properly, insert thePS/2 connector from the keyboard/mouse into the PS/2 connector on the NANO-4386A. See **Figure 5-19.**

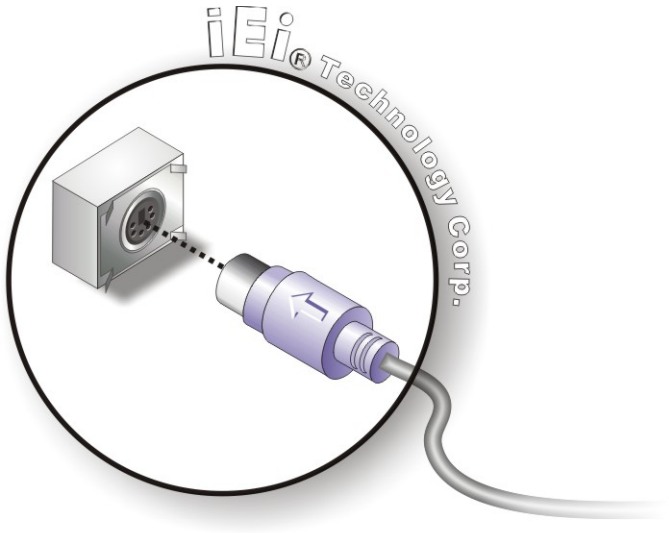


Figure 5-19: PS/2 Connector

5.7.2 RJ-45 Ethernet Connection

The NANO-4386A has two RJ-45 Ethernet connectors on the external peripheral interface panel for LAN communications. Follow the steps below to connect an RJ-45 Ethernet connector to the NANO-4386A.

Step 1: **Locate the RJ-45 connector**. The location of the RJ-45 connector is shown in **Chapter 3**.

Step 2: **Insert an RJ-45 plug**. Insert the RJ-45 plug of a LAN into the RJ-45 receptacle on the external peripheral interface. See **Figure 5-20**.

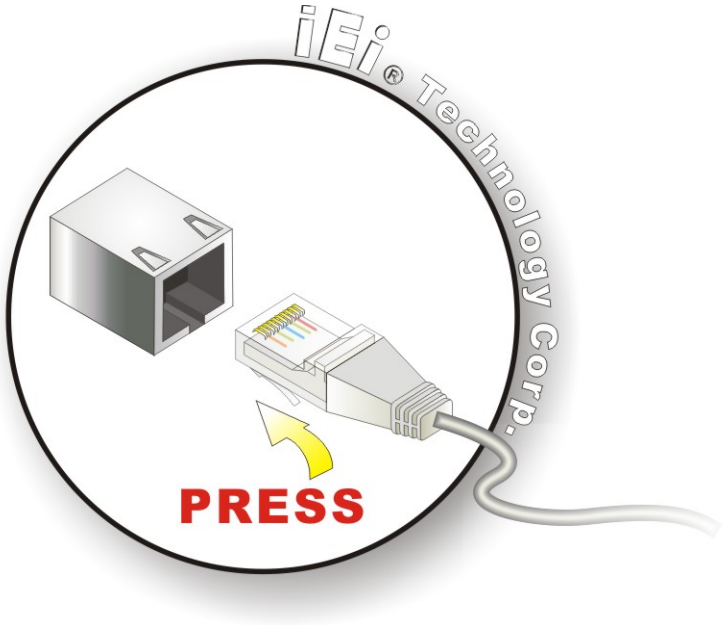


Figure 5-20: RJ-45 Ethernet Connector

5.7.3 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the NANO-4386A.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface.

See **Figure 5-21**.

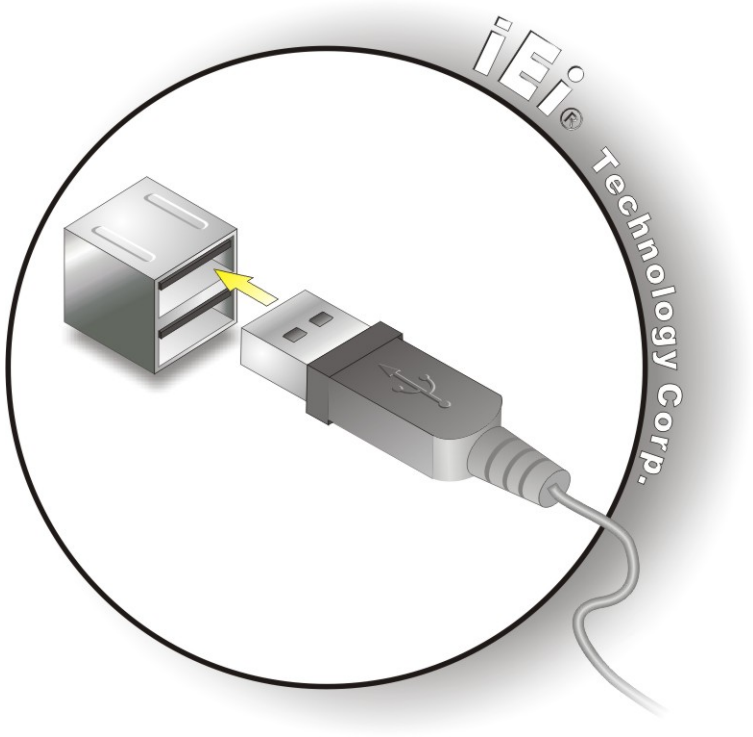


Figure 5-21: USB Connector

5.7.4 VGA Monitor Connection

The NANO-4386A has a single female DB-15 connector on the external peripheral interface panel for a VGA monitor. Follow the steps below to connect a VGA monitor to the NANO-4386A.

Step 1: **Locate the DB-15 connector**. The location of the DB-15 connector is shown in **Chapter 3**.

Step 2: **Insert the VGA connector**. Insert the DB-15 connector of a VGA monitor into the DB-15 connector on the external peripheral interface. See **Figure 5-22**.

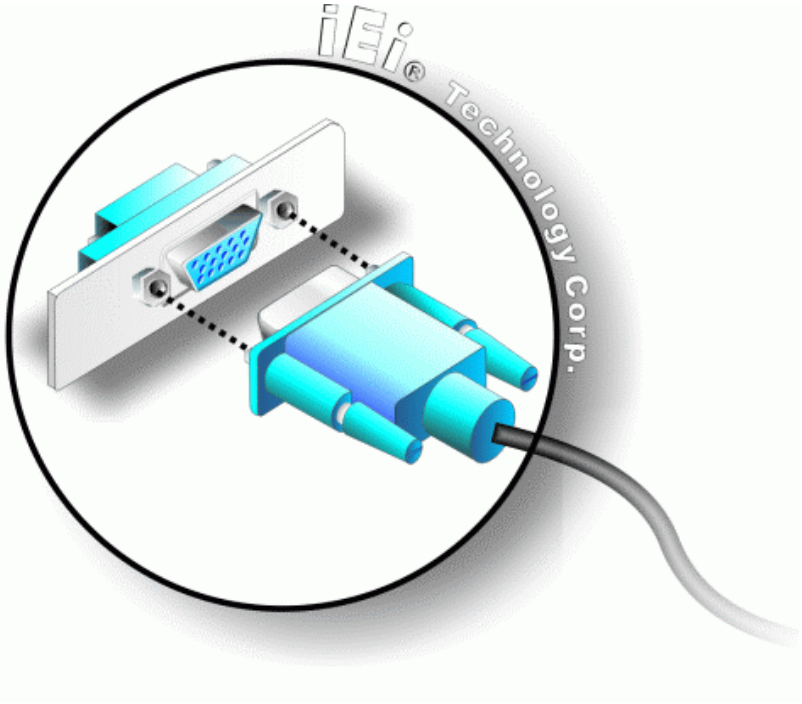


Figure 5-22: VGA Connector

Step 3: **Secure the connector**. Secure the VGA connector to the external interface by tightening the two retention screws on either side of the connector.

5.7.5 Serial Device Connection

The NANO-4386A has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the NANO-4386A.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See **Figure 5-23**.

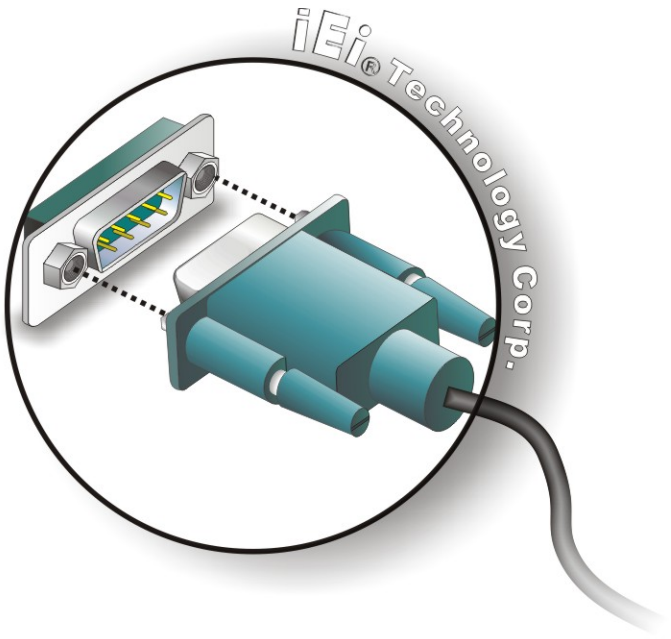


Figure 5-23: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

Chapter

6

AMI BIOS

6.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

6.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the DELETE key is pressed, restart the computer and try again.

6.1.2 Using Setup

Use the arrow keys to highlight items, press ENTER to select, use the PageUp and PageDown keys to change entries, press F1 for help and press ESC to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

Key	Function
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 6-1: BIOS Navigation Keys

6.1.3 Getting Help

When F1 is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press ESC or the F1 key again.

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Section 5.4**.

6.1.5 BIOS Menu Bar

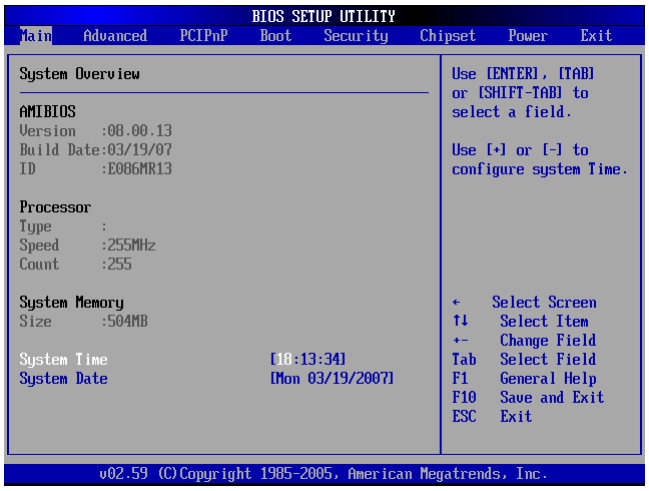
The menu bar on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

6.2 Main

The Main BIOS menu (**BIOS Menu 1**) appears when the BIOS Setup program is entered. The Main menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The System Overview lists a brief summary of different system components. The fields in System Overview cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor
  - **Speed**: Lists the processor speed
  - **Count**: The number of CPUs on the motherboard
- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the System Time option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the System Date option to set the system date. Manually enter the day, month and year.

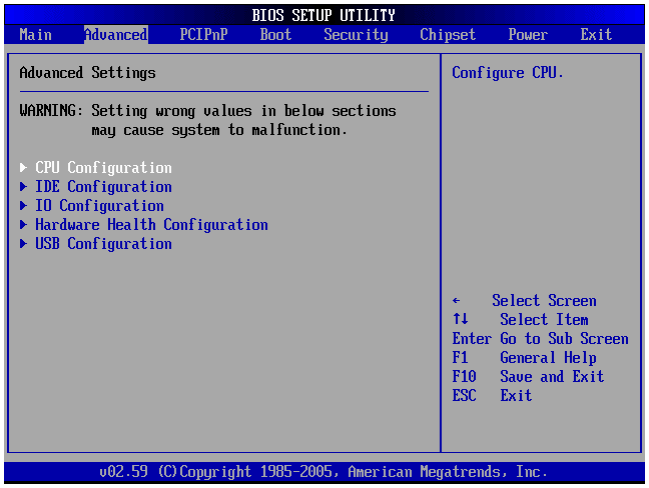
6.3 Advanced

Use the Advanced menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- **CPU Configuration** (see **Section 6.3.1**)
- **IDE Configuration** (see **Section 6.3.2**)
- **IO Configuration** (see **Section 6.3.3**)
- **Hardware Health Configuration** (see **Section 6.3.4**)
- **USB Configuration** (see **Section 6.3.5**)



BIOS Menu 2: Advanced

6.3.1 CPU Configuration

Use the CPU Configuration menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.

BIOS Menu 3: CPU Configuration

The CPU Configuration menu lists the following CPU details:

- **Module Version**: xx.xx
- **Manufacturer**: Lists the name of the CPU manufacturer
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size

The following **CPU Configuration** menu items can be configured.

- CPU TM Function
- Intel ® SpeedStep (tm) tech.

➔ **CPU TM Function [Enabled]**

Use the **CPU TM Function** option to enable or disable the CPU TM function.

➔ **Disabled**		CPU TM Function disabled
➔ **Enabled**	**DEFAULT**	CPU TM Function enabled

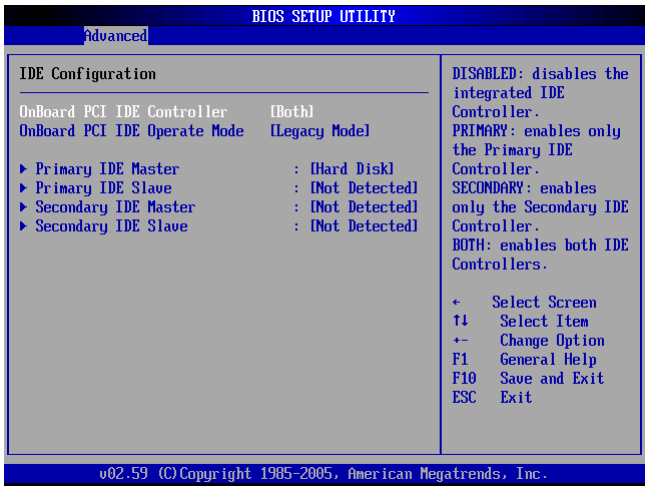
➔ **Intel (R) SpeedStep (tm) tech. [Automatic]**

Use the **Intel (R) SpeedStep (tm) tech.** option to set the CPU speed.

➔ **Maximum Speed**		CPU speed is set to maximum
➔ **Minimum Speed**		CPU speed is set to minimum
➔ **Automatic**	**DEFAULT**	CPU speed is set to automatic
➔ **Disabled**		CPU speed is disabled

6.3.2 IDE Configuration

Use the IDE Configuration menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.


BIOS SETUP UTILITY
Advanced
IDE Configuration
OnBoard PCI IDE Controller [Both]
OnBoard PCI IDE Operate Mode [Legacy Mode]
▸ Primary IDE Master : [Hard Disk]
▸ Primary IDE Slave : [Not Detected]
▸ Secondary IDE Master : [Not Detected]
▸ Secondary IDE Slave : [Not Detected]
DISABLED: disables the integrated IDE Controller.
PRIMARY: enables only the Primary IDE Controller.
SECONDARY: enables only the Secondary IDE Controller.
BOTH: enables both IDE Controllers.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 4: IDE Configuration

➔ **OnBoard PCI IDE Controller [Both]**

Use the **OnBoard PCI IDE Controller** BIOS option to specify the IDE channels used by the onboard PCI IDE controller. The following configuration options are available.

➔ **Disabled** Prevents the system from using the onboard IDE controller

➔ **Primary** Only allows the system to detect the Primary IDE channel, including both the Primary Master and the Primary Slave

➔ **Secondary** Only allows the system to detect the Secondary IDE channel, including both the Secondary Master and Secondary Slave

➔ **Both** **DEFAULT** Allows the system to detect both the Primary and Secondary IDE channels including the Primary Master, Primary Slave, Secondary Master and Secondary Slave.

➔ **Onboard PCI IDE Operate Mode [Legacy Mode]**

Use the **Onboard PCI IDE Operate Mode** BIOS option to set the running mode for the PCI IDE.

➔ **Legacy Mode** (Default) The PCI IDE mode is the same as the IDE mode

➔ **Native Mode** The PCI IDE mode is the native mode

➔ **IDE 0 (Master) and IDE 1 (Slave)**

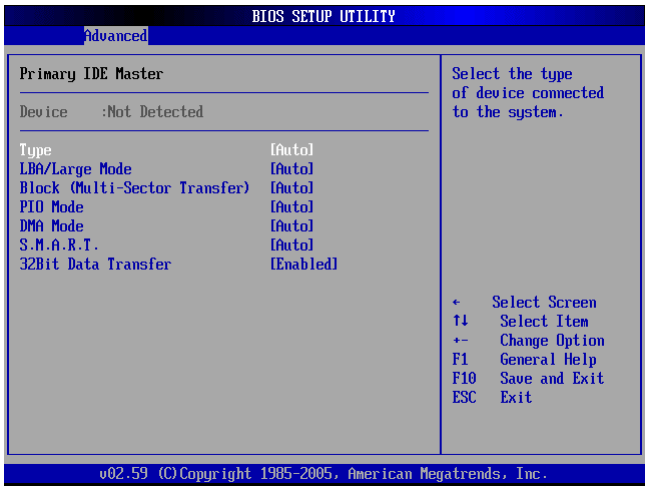
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the IDE Configuration menu:

- Primary IDE 0 (Master)
- Primary IDE 1 (Slave)
- Third IDE 0 (Master)
- Third IDE 1 (Slave)
- Fourth IDE 0 (Master)
- Fourth IDE 1 (Slave)

The IDE Configuration menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 6.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

Use the IDE Master and IDE Slave configuration menu (BIOS Menu 5) to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **DMA Mode**: Adjust the DMA mode options.

- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the Type BIOS option to select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.

➔ **Auto** **DEFAULT** The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

➔ **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

➔ **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

- ➔ **ZIP**
- ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the LBA/Large Mode option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.

➔ **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the Block (Multi Sector Transfer) to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the PIO Mode option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps

➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps

➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps

➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps

- **4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

DMA Mode [Auto]

Use the DMA Mode BIOS selection to adjust the DMA mode options.

- **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
- **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
- **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
- **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
- **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
- **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
- **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps
- **UDMA1** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
- **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps

- **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
- **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the S.M.A.R.T option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. S.M.A.R.T predicts impending drive failures. The S.M.A.R.T BIOS option enables or disables this function.

- **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- **Disabled** Prevents BIOS from using the HDD SMART feature.
- **Enabled** Allows BIOS to use the HDD SMART feature

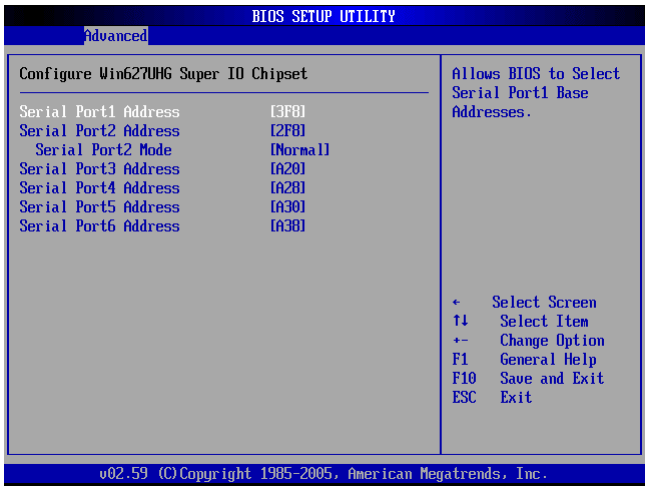
➔ **32Bit Data Transfer [Enabled]**

Use the 32Bit Data Transfer BIOS option to enables or disable 32-bit data transfers.

- **Disabled** Prevents the BIOS from using 32-bit data transfers.
- **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

6.3.3 IO Configuration

Use the IO Configuration menu (**BIOS Menu 6**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 6: Super IO Configuration

➔ **Serial Port1 Address [3F8]**

Use the Serial Port1 Address option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8**	**DEFAULT**	Serial Port 1 I/O port address is 3F8
➔ **3E8**		Serial Port 1 I/O port address is 3E8
➔ **2E8**		Serial Port 1 I/O port address is 2E8

➔ **Serial Port2 Address [2F8]**

Use the Serial Port2 Address option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8**	**DEFAULT**	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3

- **3E8** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
- **2E8** Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the Serial Port2 Mode option to select the Serial Port2 operational mode.

- **Normal** **DEFAULT** Serial Port 2 mode is normal
- **IrDA** Serial Port 2 mode is IrDA
- **ASK IR** Serial Port 2 mode is ASK IR

➔ **Serial Port3 Address [A20]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

- **Disabled** No base address is assigned to serial port 3
- **A20** **DEFAULT** Serial port 3 I/O port address is A20

➔ **Serial Port4 Address [A28]**

Use the **Serial Port4 Address** option to select the base addresses for serial port 4

- **Disabled** No base address is assigned to serial port 4
- **A28** **DEFAULT** Serial port 4 I/O port address is A28

➔ **Serial Port5 Address [A30]**

Use the **Serial Port5 Address** option to select the base addresses for serial port 5

➔ **Disabled** No base address is assigned to serial port 5

➔ **A30** **DEFAULT** Serial port 5 I/O port address is A30

➔ **Serial Port6 Address [A38]**

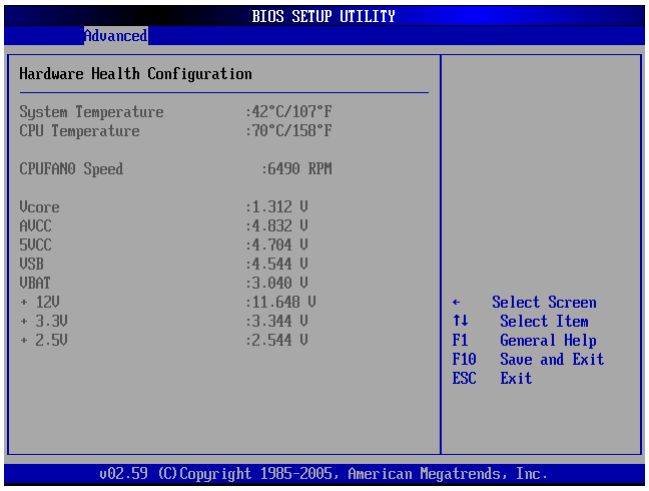
Use the **Serial Port6 Address** option to select the base addresses for serial port 6

➔ **Disabled** No base address is assigned to serial port 6

➔ **A38** **DEFAULT** Serial port 6 I/O port address is A38

6.3.4 Hardware Health Configuration

The Hardware Health Configuration menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.



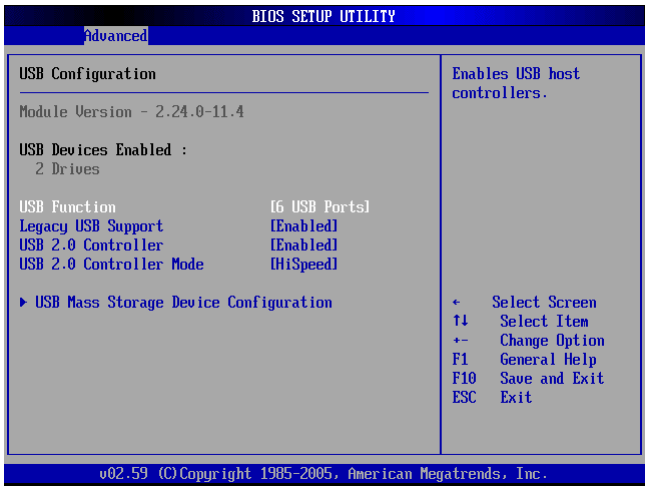
BIOS Menu 7: Hardware Health Configuration

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - System Temperature
  - CPU Temperature
- **Fan Speeds**: The following cooling fan speeds are monitored
  - CPU Fan
- **Voltages**: The following system voltages are monitored
  - Vcore
  - AVCC
  - 5VCC
  - VSB
  - VBAT
  - +12V
  - +3.3V
  - +2.5V

6.3.5 USB Configuration

Use the USB Configuration menu (**BIOS Menu 8**) to read USB configuration information and configure the USB settings.



BIOS Menu 8: USB Configuration

➔ **USB Configuration**

The USB Configuration field shows the system USB configuration. The items listed are:

- Module Version: x.xx.x-xx.x

➔ **USB Devices Enabled**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system.

➔ **USB Function [6 USB Ports]**

Use the USB Function BIOS option to enable or disable a specified number of USB ports. If only two USB ports are being used, disabling the remaining six USB frees up system resources that can be redirected elsewhere.

➔	**Disabled**		USB function support disabled
➔	**2 USB Ports**		Two USB ports are enabled
➔	**4 USB Ports**		Four USB ports are enabled
➔	**6 USB Ports**	**DEFAULT**	Six USB ports are enabled

➔ **Legacy USB Support [Enabled]**

Use the Legacy USB Support BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔	**Disabled**		Legacy USB support disabled
➔	**Enabled**	**DEFAULT**	Legacy USB support enabled
➔	**Auto**		Legacy USB support disabled if no USB devices are connected

➔ **USB 2.0 Controller [Enabled]**

Use the USB 2.0 Controller BIOS option to enable or disable the USB 2.0 controller

➔ **Disabled**		USB 2.0 controller disabled
➔ **Enabled**	**DEFAULT**	USB 2.0 controller enabled

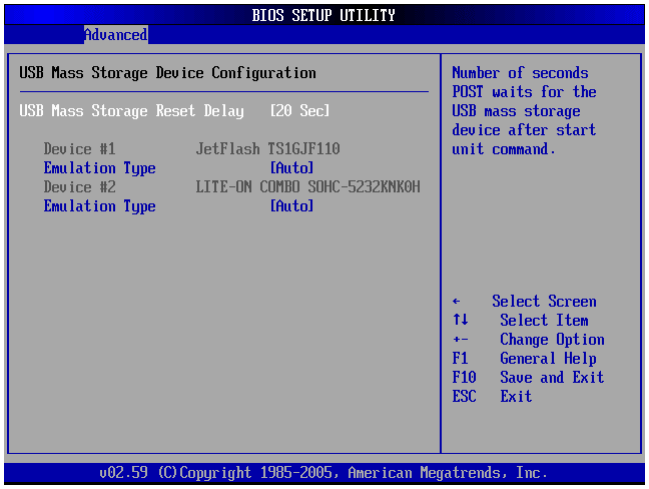
➔ **USB 2.0 Controller Mode [HiSpeed]**

The **USB 2.0 Controller Mode** BIOS option sets the speed of the USB 2.0 controller.

➔ **FullSpeed**		The controller is capable of operating at full speed (12Mbits/second)
➔ **HiSpeed**	**DEFAULT**	The controller is capable of operating at high speed (480Mbits/second)

6.3.5.1 USB Mass Storage Device Configuration

Use the USB Mass Storage Device Configuration menu (**BIOS Menu 9**) lists the USB mass storage class devices.


BIOS SETUP UTILITY
Advanced
USB Mass Storage Device Configuration
USB Mass Storage Reset Delay [20 Sec]
Device #1 JetFlash TS1GJF110
Emulation Type [Auto]
Device #2 LITE-ON COMBO SOHC-5232KNK0H
Emulation Type [Auto]
Number of seconds POST waits for the USB mass storage device after start unit command.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 9: USB Mass Storage Device Configuration

➔ **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

➔ **Emulation Type [Auto]**

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

NOTE:

Please note that the device's formatted type and the emulation type provided by the BIOS must match for a device to boot properly. If both types do not match then device's behavior is undefined. To make sure both types match, format the device using BIOS INT13h calls after selecting the proper emulation option in BIOS setup. The FORMAT utility provided by Microsoft® MS-DOS®, Microsoft® Windows® 95, and Microsoft® Windows® 98 can be used for this purpose.

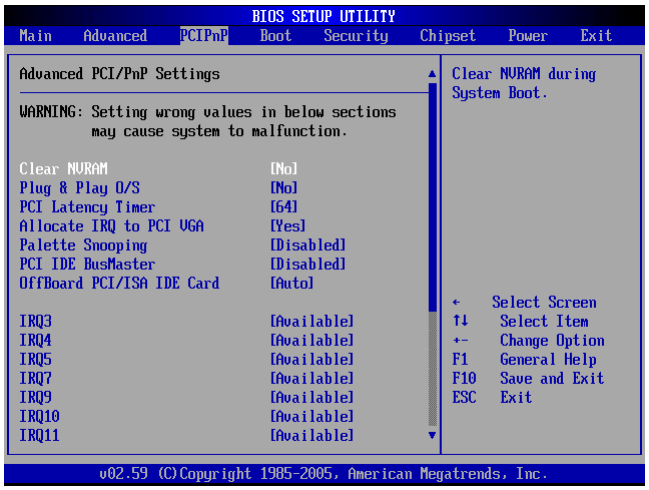
➔ **Auto**	**DEFAULT**	BIOS auto-detects the current USB.
➔ **Floppy**		The USB device will be emulated as a floppy drive. The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.
➔ **Forced FDD**		Allows a hard disk image to be connected as a floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.
➔ **Hard Disk**		Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.
➔ **CDROM**		Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.

6.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 10**) to configure advanced PCI and PnP settings.

WARNING!

Setting wrong values for the BIOS selections in the PCI/PnP BIOS menu may cause the system to malfunction.



BIOS Menu 10: PCI/PnP Configuration

➔ Clear NVRAM [No]

Use the **Clear NVRAM** option to specify if the NVRAM (Non-Volatile RAM) is cleared when the power is turned off.

➔ **No**	**DEFAULT**	System does not clear NVRAM during system boot
➔ **Yes**		System clears NVRAM during system boot

➔ Plug & Play O/S [No]

Use the **Plug & Play O/S** BIOS option to specify whether system plug and play devices are configured by the operating system or the BIOS.

➔ **No** **DEFAULT** If the operating system does not meet the Plug and Play specifications, this option allows the BIOS to configure all the devices in the system.

➔ **Yes** This setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.

➔ **PCI Latency Timer [64]**

Use the **PCI Latency Timer** option to specify the PCI latency time. The latency time is measured in units of PCI clock cycles for the PCI device latency timer register. Configuration options are:

- 32
- 64 **DEFAULT**
- 96
- 128
- 160
- 192
- 224
- 248

➔ **Allocate IRQ to PCI VGA [Yes]**

Use the **Allocate IRQ to PCI VGA** option to restrict the system from giving the VGA adapter card an interrupt address.

➔ **Yes** (Default) Assigns an IRQ to a PCI VGA card if card requests IRQ

➔ **No** Does not assign IRQ to a PCI VGA card even if the card requests an IRQ

➔ **Palette Snooping [Disabled]**

Use the **Palette Snooping** option to enable or disable the palette snooping function.

➔ **Disabled** **DEFAULT** Unless the VGA card manufacturer requires palette snooping to be enabled, this option should be disabled.

➔ **No/Enabled** PCI devices are informed that an ISA based Graphics device is installed in the system so the ISA based Graphics card functions correctly. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with the adapter card manual first, before modifying the default settings in the BIOS.

➔ **PCI IDE BusMaster [Disabled]**

Use the **PCI IDE BusMaster** BIOS option to enable or prevent PCI IDE busmastering.

➔ **Disabled** **DEFAULT** Busmastering is prevented

➔ **No/Enabled** IDE controller on the PCI local bus has mastering capabilities

➔ **OffBoard PCI/ISA IDE Card [Auto]**

Use the **OffBoard PCI/ISA IDE Card** BIOS option to select the **OffBoard PCI/ISA IDE Card**.

➔ **Auto** **DEFAULT** The location of the Off Board PCI IDE adapter card is automatically detected by the AMIBIOS.

➔ **PCI Slot 1** PCI Slot 1 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 1.

➔ **PCI Slot 2** PCI Slot 2 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 2.

➔ **PCI Slot 3** PCI Slot 3 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 3.

➔ **PCI Slot 4** PCI Slot 4 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 4.

➔ **PCI Slot 5** PCI Slot 5 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 5.

➔ **PCI Slot 6** PCI Slot 6 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 6.

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available**	**DEFAULT**	The specified DMA is available to be used by PCI/PnP devices
➔ **Reserved**		The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

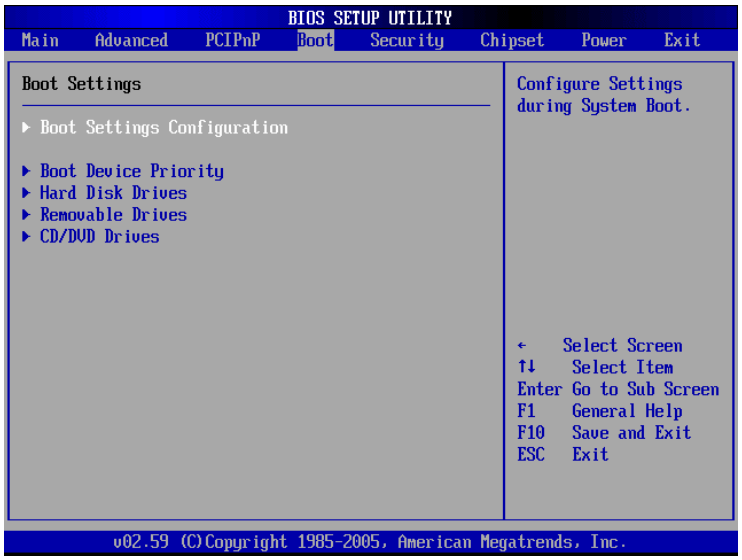
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔	**Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔	**16K**		16KB reserved for legacy ISA devices
➔	**32K**		32KB reserved for legacy ISA devices
➔	**64K**		54KB reserved for legacy ISA devices

6.5 Boot

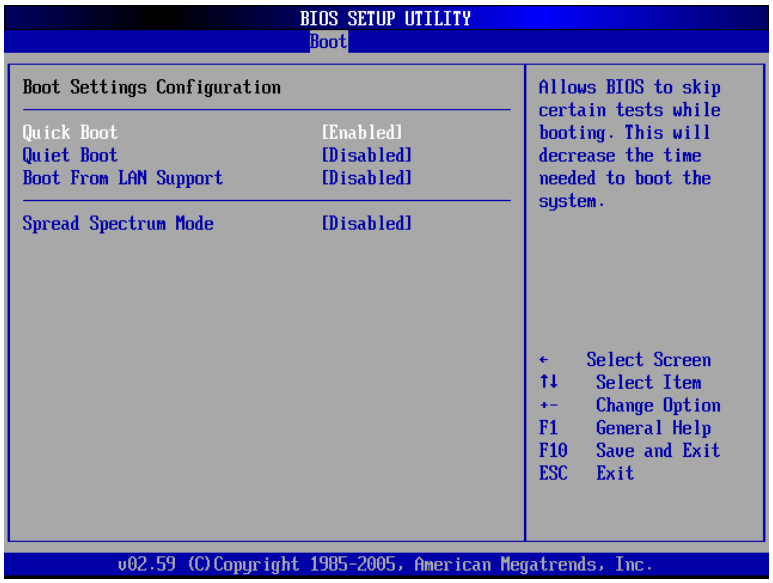
Use the **Boot** menu (BIOS Menu 11) to configure system boot options.



BIOS Menu 11: Boot

6.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (BIOS Menu 12) to configure advanced system boot options.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
Boot From LAN Support [Disabled]
Spread Spectrum Mode [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 12: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed
➔ **Enabled**		OEM Logo displayed instead of POST messages

➔ **Boot From LAN Support [Disabled]**

Use the **BOOT From LAN Support** option to enable the system to be booted from a remote system.

➔ **Disabled**	(Default)	Cannot be booted from a remote system through the LAN
➔ **Enabled**	(Default)	Can be booted from a remote system through the LAN

➔ **Spread Spectrum Mode [Disabled]**

The **Spread Spectrum Mode** option can help to improve CPU EMI issues.

➔ **Disabled**	**DEFAULT**	The spread spectrum mode is disabled
➔ **Enabled**		The spread spectrum mode is enabled

6.5.2 Boot Device Priority

Use the Boot Device Priority menu (**BIOS Menu 13**) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD

BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device [USB:JetFlash TS1GJ]
2nd Boot Device [USB:LITE-ON COMBO]
3rd Boot Device [HDD:PM-ST3200820A]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 13: Boot Device Priority Settings

6.5.3 Hard Disk Drives

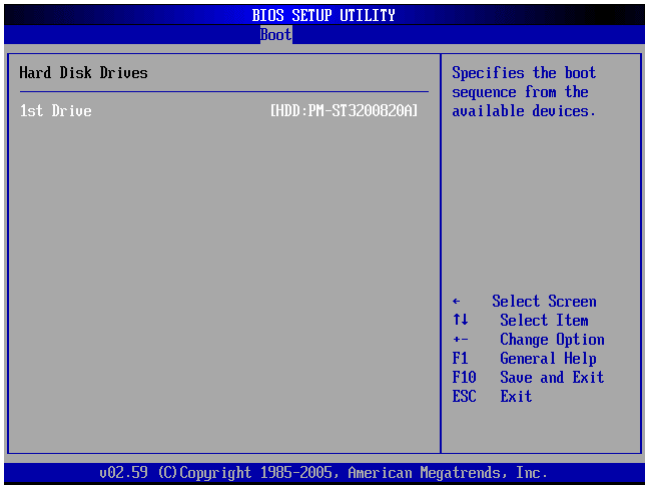
Use the **Hard Disk Drives** menu (BIOS Menu 14) to specify the boot sequence of the available HDDs. When the menu is opened, the HDDs connected to the system are listed as shown below:

- 1st Drive [HDD: PM-(part number)]
- 2nd Drive [HDD: PS-(part number)]
- 3rd Drive [HDD: SM-(part number)]
- 4th Drive [HDD: SM-(part number)]

NOTE:

Only the drives connected to the system are shown. For example, if only two HDDs are connected only "**1st Drive**" and "**2nd Drive**" are listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available HDDs is shown. Select the first HDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



BIOS Menu 14: Hard Disk Drives

6.5.4 Removable Drives

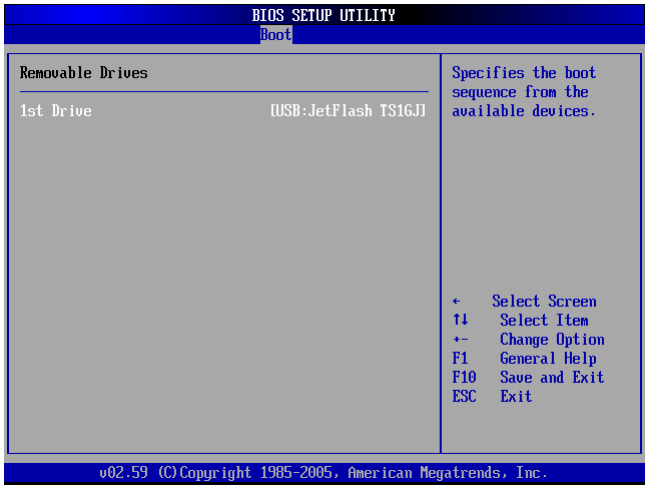
Use the Removable Drives menu (**BIOS Menu 15**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive [1st FLOPPY DRIVE]
- 2nd Drive [2nd FLOPPY DRIVE]

NOTE:

Only the drives connected to the system are shown. For example, if only one FDD is connected only "**1st Drive**" is listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



BIOS Menu 15: Removable Drives

6.5.5 CD/DVD Drives

Use the **CD/DVD Drives** menu (BIOS Menu 16) to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:

- 1st Drive [CD/DVD: PM-(part ID)]
- 2nd Drive [HDD: PS-(part ID)]
- 3rd Drive [HDD: SM-(part ID)]
- 4th Drive [HDD: SM-(part ID)]

NOTE:

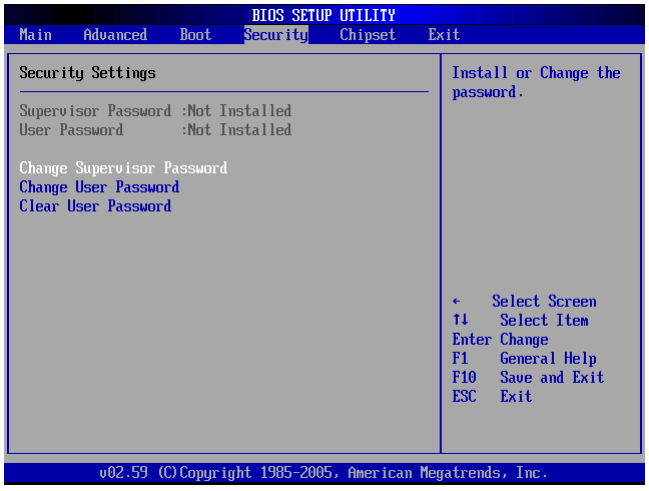
Only the drives connected to the system are shown. For example, if only two CDs or DVDs are connected only "**1st Drive**" and "**2nd Drive**" are listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available CD/DVD drives is shown. Select the first CD/DVD drive the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.

BIOS Menu 16: CD/DVD Drives

6.6 Security

Use the Security menu (**BIOS Menu 17**) to set system and user passwords.



BIOS Menu 17: Security

➔ Change Supervisor Password

Use the Change Supervisor Password to set or change a supervisor password. The default for this option is Not Installed. If a supervisor password must be installed, select this field and enter the password. After the password has been added, Install appears next to Change Supervisor Password.

➔ **User Access Level [Full Access]**

A supervisor password must be installed to make this option available. The **User Access Level** option specifies the access a normal user has to the BIOS settings.

➔ **No Access**		Users have no access to the **Setup Utility**
➔ **View Only**		Users can only view the **Setup Utility**
➔ **Limited**		Users can change limited fields like date and time
➔ **Full Access**	**DEFAULT**	Users have full access to the **Setup Utility**

➔ **Change User Password**

Use the Change User Password to set or change a user password. The default for this option is Not Installed. If a user password must be installed, select this field and enter the password. After the password has been added, Install appears next to Change User Password.

➔ **Clear User Password**

A user password must be installed to make this option available. Use the **Clear User Password** option to delete a user password.

➔ **Password Check [Setup]**

A supervisor password must be installed to make this option available. The **Password Check** option specifies when a user is prompted for the password.

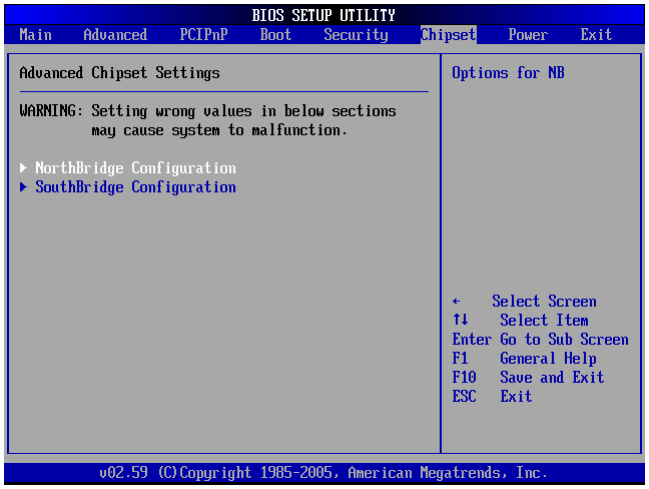
➔ **Setup**	**DEFAULT**	Users have to enter their password only when they enter the **Setup Utility**
➔ **Always**		Users have to enter their password whenever they boot the computer

6.7 Chipset

Use the Chipset menu (**BIOS Menu 18**) to access the NorthBridge and SouthBridge configuration menus.

WARNING:

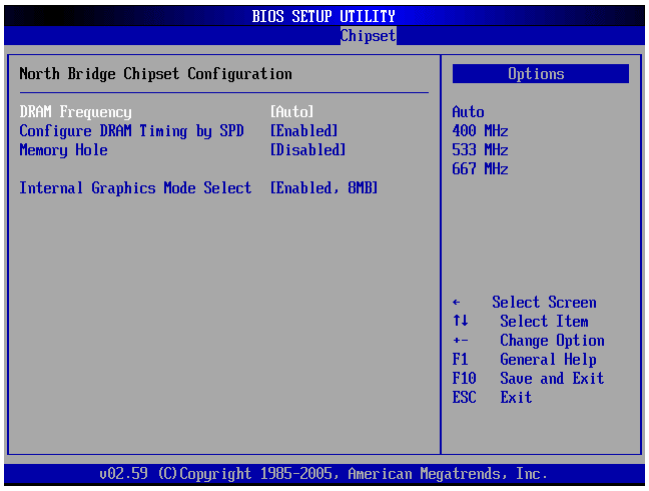
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 18: Chipset

6.7.1 NorthBridge Configuration

Use the NorthBridge Configuration menu (**BIOS Menu 19**) to configure the northbridge chipset.



BIOS Menu 19:NorthBridge Chipset Configuration

➔ **DRAM Frequency [Auto]**

The **DRAM Frequency** option specifies the DRAM frequency or allows the system to automatically detect the DRAM frequency.

➔ **200MHz**		Sets the DRAM frequency to 200MHz
➔ **266MHz**		Sets the DRAM frequency to 266MHz
➔ **Auto**	**DEFAULT**	Automatically selects the DRAM frequency

➔ **Configure DRAM Timing by SPD [Enabled]**

The **Configure DRAM Timing by SPD** option determines if the system uses the SPD (Serial Presence Detect) EEPROM to configure the DRAM timing. The SPD EEPROM contains all necessary DIMM specifications the including speed of the individual components such as CAS and bank cycle time as well as valid settings for the module and the manufacturer's code. The SPD enables the BIOS to read the spec sheet of the DIMMs on boot-up and then adjust the memory timing parameters accordingly.

➔ **Disabled** DRAM timing parameters can be manually set using the DRAM sub-items

➔ **Enabled** **DEFAULT** DRAM timing parameter are set according to the DRAM Serial Presence Detect (SPD)

The **Configure DRAM Timing by SPD** option is disabled, the following configuration options appear.

- DRAM CAS# Latency [2.5]
- DRAM RAS# Precharge [3 clocks]
- DRAM RAS# to CAS# Delay [6 clocks]
- DRAM Precharge Delay [7 clocks]
- DRAM Burst Length [4]

➔ **DRAM CAS# Latency [2.5]**

The **DRAM CAS# Latency** option refers to the Column Address Strobe (CAS) delay time. To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**." The following configuration options are available.

- 2.5 nanoseconds **DEFAULT**
- 2 nanoseconds

➔ **DRAM RAS# Precharge [3 Clocks]**

Use the **DRAM RAS# Precharge** option to set the speed at which the RAM terminates the access of one row and start accessing another. To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**." The following configuration options are available

- 2 DRAM Clocks
- 3 DRAM Clocks **DEFAULT**

➔ **DRAM RAS# to CAS# Delay [3 Clocks]**

Use the **DRAM RAS# to CAS# Delay** option to specify the number of clock cycles must elapse between sending a RAS (row address strobe) signal and the CAS (column address strobe) signal. A pause is required between the RAS signal and the CAS signal to ensure the memory is correctly addressed. To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**." Configuration options are listed below:

- 2 DRAM Clocks
- 3 DRAM Clocks **DEFAULT**

➔ **DRAM RAS# Precharge Delay [7 Clocks]**

Use the **DRAM RAS# Precharge Delay** option to specify the length of the delay between the activation and precharge commands for the RAS signal. That is how long after activation can the access cycle be started again. This influences row activation time that is considered when memory has hit the last column in a specific row, or when an entirely different memory location is requested. To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**." The following configuration options are available:

- 5 DRAM Clocks
- 6 DRAM Clocks
- 7 DRAM Clocks **DEFAULT**

➔ **DRAM Burst Length [4]**

The **DRAM Burst Length** BIOS option selects the reads/writes per burst transaction. The following options are available:

- 4 read or writes per burst transaction **DEFAULT**
- 8 read or writes per burst transaction

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled**	**DEFAULT**	Memory is not reserved for ISA expansion cards
➔ **15MB – 16MB**		Between 15MB and 16MB of memory is reserved for ISA expansion cards

➔ **Init. Graphic Adapter Priority [Internal VGA]**

The **Init. Graphic Adapter Priority** option selects the graphics controller the system uses as a primary boot device. The options are:

- Internal VGA
- PCI/Int-VGA **DEFAULT**

➔ **Internal Graphics Mode Select [Enable, 8MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**		
➔ **Enable, 1MB**		1MB of memory used by internal graphics device
➔ **Enable, 4MB**		4MB of memory used by internal graphics device
➔ **Enable, 8MB**	**DEFAULT**	8MB of memory used by internal graphics device
➔ **Enable, 16MB**		16MB of memory used by internal graphics device
➔ **Enable, 32MB**		32MB of memory used by internal graphics device

➔ **Graphics Aperture Size [64MB]**

The **Graphics Aperture Size** option selects the size of the AGP aperture. The aperture is a portion of the PCI memory address range dedicated as graphics memory address space.

➔ **64MB**	**DEFAULT**	Graphics aperture size set as 64MB
➔ **128MB**		Graphics aperture size set as 128MB
➔ **256MB**		Graphics aperture size set as 256MB

6.7.1.1 Video Function Configuration

Use the **Video Function Configuration** menu to configure the video device connected to the system.

➔ **DVMT Mode Select [Combo Mode]**

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

➔ **Fixed Mode**		A fixed portion of graphics memory is reserved as graphics memory.
➔ **DVMT Mode**		Graphics memory is dynamically allocated according to the system and graphics needs.
➔ **Combo Mode**	**DEFAULT**	A fixed portion of graphics memory is reserved as graphics memory. If more memory is needed, graphics memory is dynamically allocated according to the system and graphics needs.

➔ **Boot Display Device**

Use the **Boot Display Device** option to select the display device used by the system when it boots. Configuration options are listed below.

- Auto
- CRT
- LFP
- CRT + LFP **DEFAULT**

➔ **Flat Panel Type**

Use the **Flat Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

- 1280x1024 48bit
- 800x600 18bit
- 1024x768 18bit
- 1280x1024 36bit
- 1400x1050 36bit
- 1024x768 48bit

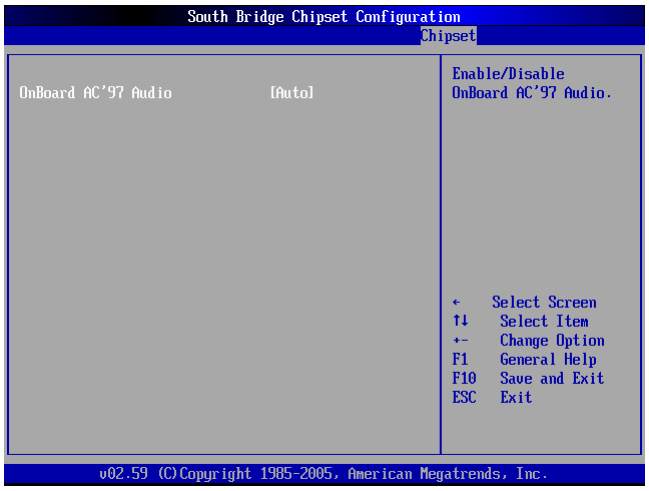
➔ **Local Flat Panel Scaling [Auto]**

Use the **Local Flat Panel Scaling** option to select the method of scaling for the flat panel screen attached to the system.

➔	**Auto**	**DEFAULT**	Scaling is automatic
➔	**Forced Scaling**		Scaling is forced
➔	**Disabled**		Scaling is disabled

6.7.2 SouthBridge Configuration

The **SouthBridge Configuration** menu (**BIOS Menu 20**) the southbridge chipset to be configured.



BIOS Menu 20:SouthBridge Chipset Configuration

➔ **OnBoard AC97 Audio DEVICE [Auto]**

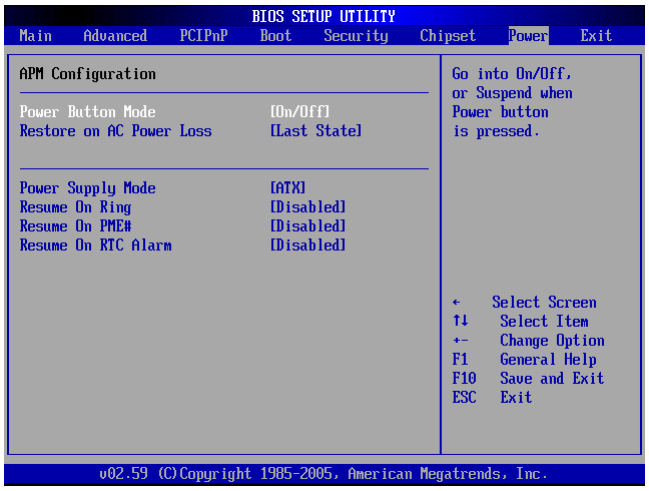
Use the **OnBoard AC97 Audio DEVICE** option to enable or disable the AC'97 CODEC.

➔ **Auto** **DEFAULT** The onboard AC'97 automatically detected and enabled

➔ **Disabled** The onboard AC'97 is disabled

6.8 Power

The **Power** menu (**BIOS Menu 21**) allows the advanced power management options to be configured.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Power Exit
APM Configuration
Power Button Mode [On/Off]
Restore on AC Power Loss [Last State]
Power Supply Mode [ATX]
Resume On Ring [Disabled]
Resume On PME# [Disabled]
Resume On RTC Alarm [Disabled]
Go into On/Off, or Suspend when Power button is pressed.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.59 (C)Copyright 1985-2005, American Megatrends, Inc.

BIOS Menu 21: Power

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Restore on AC Power Loss [Last State]**

The Restore on AC Power Loss BIOS option specifies what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**		The system remains turned off
➔ **Power On**		The system turns on
➔ **Last State**	**DEFAULT**	The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Power Supply Mode [ATX]**

Use the **Power Supply Mode** BIOS option to select the power supply that is connected to the system.

➔ **AT**		An AT power supply is connected to the system
➔ **ATX**	**DEFAULT**	An ATX power supply is connected to the system

➔ **Resume on Ring [Disabled]**

Use the **Resume on Ring** option to enable the system to be roused from a suspended or standby state when there is activity on the RI (ring in) modem line. That is, the system is roused by an incoming call on a modem.

➔ **Disabled**	**DEFAULT**	Wake event not generated by an incoming call
➔ **Enabled**		Wake event generated by an incoming call

➔ **Resume on PME# [Disabled]**

The **Resume on PME#** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the PCI PME (power management event) controller.

➔ **Disabled**	**DEFAULT**	Wake event not generated by PCI PME controller activity
➔ **Enabled**		Wake event generated by PCI PME controller activity

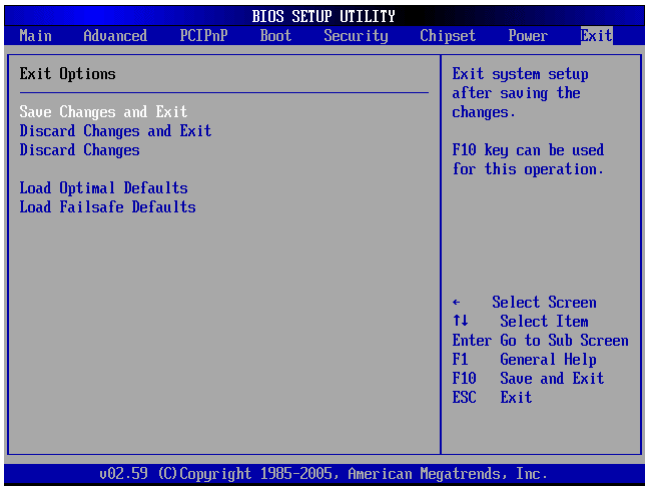
➔ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

➔ **Disabled**	**DEFAULT**	The real time clock (RTC) cannot generate a wake event
➔ **Enabled**		If selected, the following appears with values that can be selected: ➔ **RTC Alarm Date (Days)** ➔ **System Time** After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

6.9 Exit

Use the Exit menu (**BIOS Menu 22**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Power Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.59 (C)Copyright 1985-2005, American Megatrends, Inc.

BIOS Menu 22:Exit

➔ Save Changes and Exit

Use the Save Changes and Exit option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ Discard Changes and Exit

Use the Discard Changes and Exit option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ Discard Changes

Use the Discard Changes option to discard the changes and remain in the BIOS configuration setup program.

➔ Load Optimal Defaults

Use the Load Optimal Defaults option to load the optimal default values for each of the parameters on the Setup menus. F9 key can be used for this operation.

➔ **Load Failsafe Defaults**

Use the Load Failsafe Defaults option to load failsafe default values for each of the parameters on the Setup menus. F8 key can be used for this operation.

Chapter

7

Driver Installation

7.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Chipset driver
- VGA driver
- LAN driver
- USB 2.0 driver
- Audio driver

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the NANO-4386A are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the system does not initiate the "autorun" program when the CD is inserted, click the **Start** button, select **Run**, then type **X:\autorun.exe** (where **X:** is the system CD drive) to access the IEI Driver CD main menu.

Step 2: The driver main menu appears (**Figure 7-1**).

Figure 7-1: Introduction Screen

Step 3: Click NANO-4386A.

Step 4: A new screen with a list of available drivers appears (**Figure 7-2**).

Figure 7-2: Available Drivers

Step 5: Select the driver to install from the list in **Figure 7-2**. Detailed driver installation instructions follow below.

7.3 Chipset Driver Installation

To install the chipset driver, please follow the steps below.

Step 1: Select **INF** from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-3**).

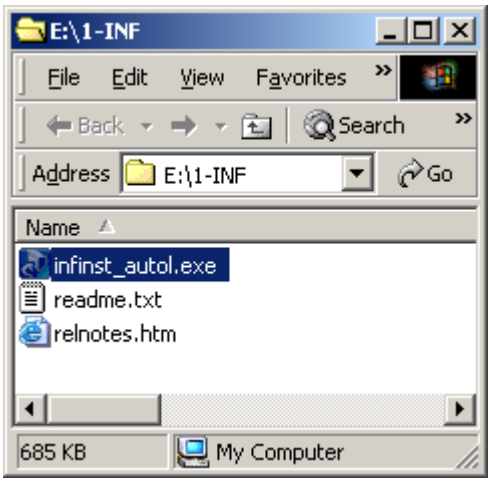


Figure 7-3: Chipset Driver Installation Program

Step 3: Double-click the **infinst_Autol.exe** icon.

Step 4: The welcome screen in **Figure 7-4** appears.

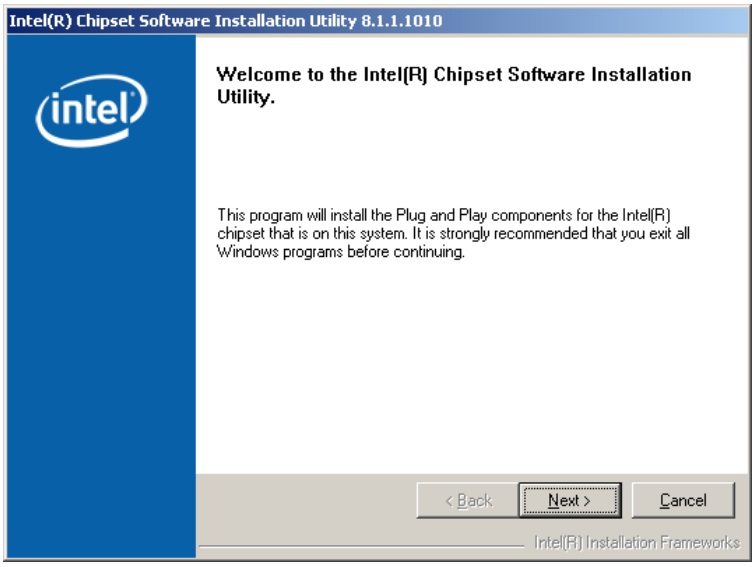

Intel(R) Chipset Software Installation Utility 8.1.1.1010
Welcome to the Intel(R) Chipset Software Installation Utility.
This program will install the Plug and Play components for the Intel(R) chipset that is on this system. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-4: Chipset Driver Installation Welcome Screen

Step 5: Click **NEXT** to continue the installation process.

Step 6: The license agreement in **Figure 7-5** appears.

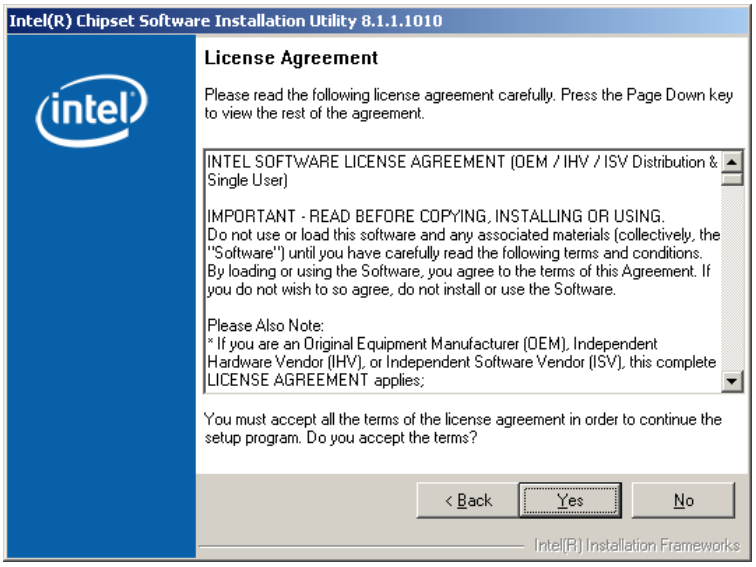

Intel(R) Chipset Software Installation Utility 8.1.1.1010
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions.
By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-5: Chipset Driver Installation License Agreement

Step 7: Read the license agreement. To accept the terms and conditions stipulated in the agreement, click **YES**.

Step 8: The Readme file in **Figure 7-6** appears.

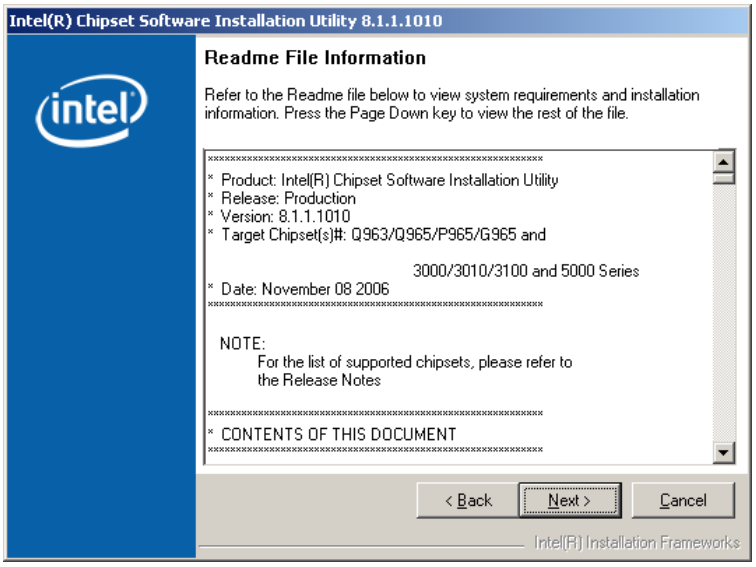

Intel(R) Chipset Software Installation Utility 8.1.1.1010
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Product: Intel(R) Chipset Software Installation Utility
* Release: Production
* Version: 8.1.1.1010
* Target Chipset(s)#: Q963/Q965/P965/G965 and
3000/3010/3100 and 5000 Series
* Date: November 08 2006
NOTE:
For the list of supported chipsets, please refer to the Release Notes
* CONTENTS OF THIS DOCUMENT
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-6: Chipset Driver Readme File Information

Step 9: Read the Readme file information and then click **NEXT** to start the driver installation.

Step 10: After the driver installation process is complete, a confirmation screen appears (**Figure 7-7**).

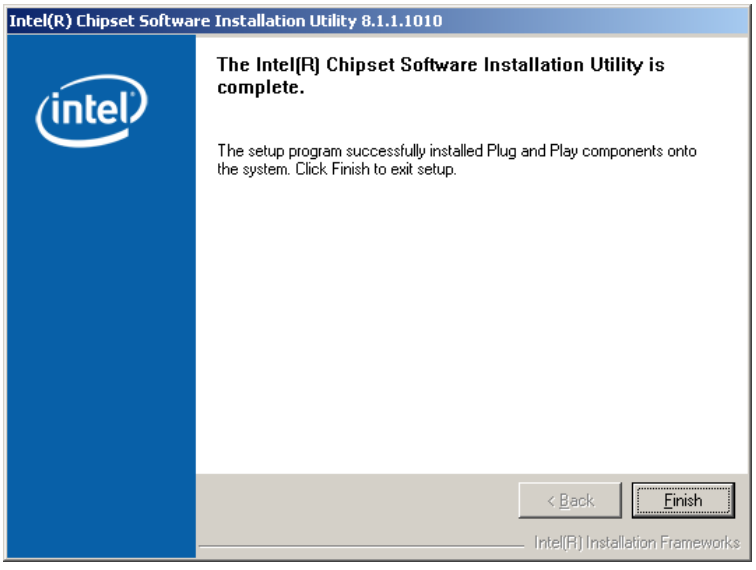

Intel(R) Chipset Software Installation Utility 8.1.1.1010
The Intel(R) Chipset Software Installation Utility is complete.
The setup program successfully installed Plug and Play components onto the system. Click Finish to exit setup.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-7: Chipset Driver Installation Complete

Step 11: Click **FINISH** to complete the driver installation.

7.4 Intel Graphics Media Accelerator Driver

To install the VGA driver, please follow the steps below.

Step 1: Select the VGA driver from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-8**).

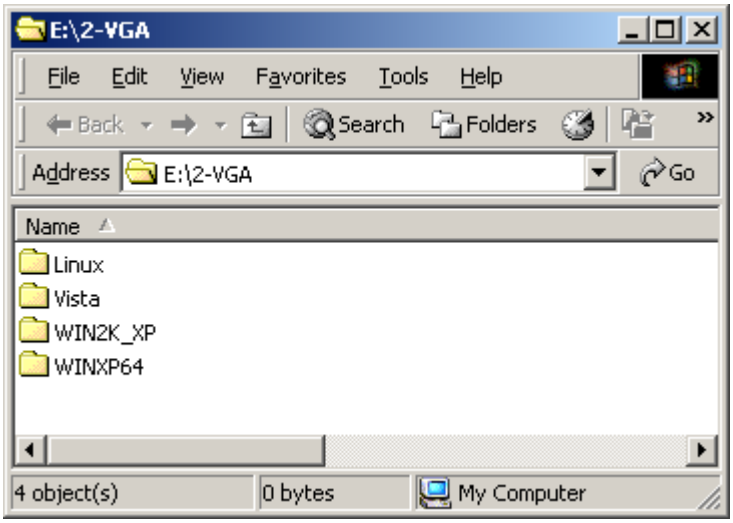


Figure 7-8: Select the Operating System

Step 3: Double-click the appropriate operating system folder.

Step 4: A new window appears (**Figure 7-9**).

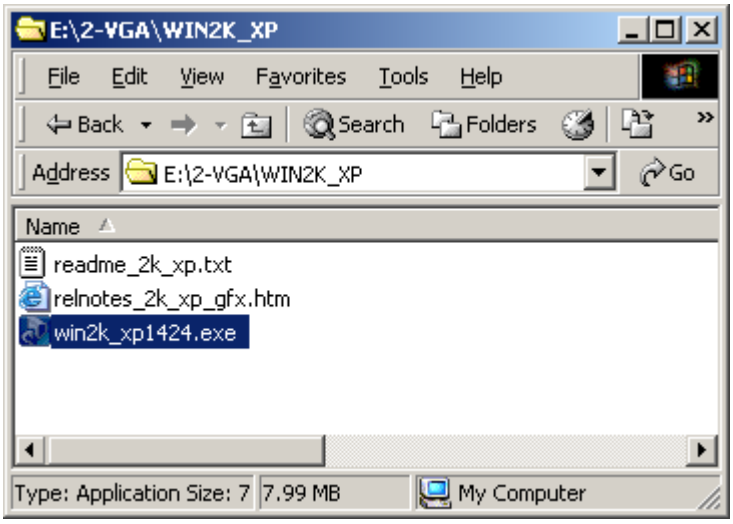


Figure 7-9: VGA Driver

Step 5: Double-click the installation program icon to continue the installation process.

Step 6: The Readme information file shown in **Figure 7-10** appears.

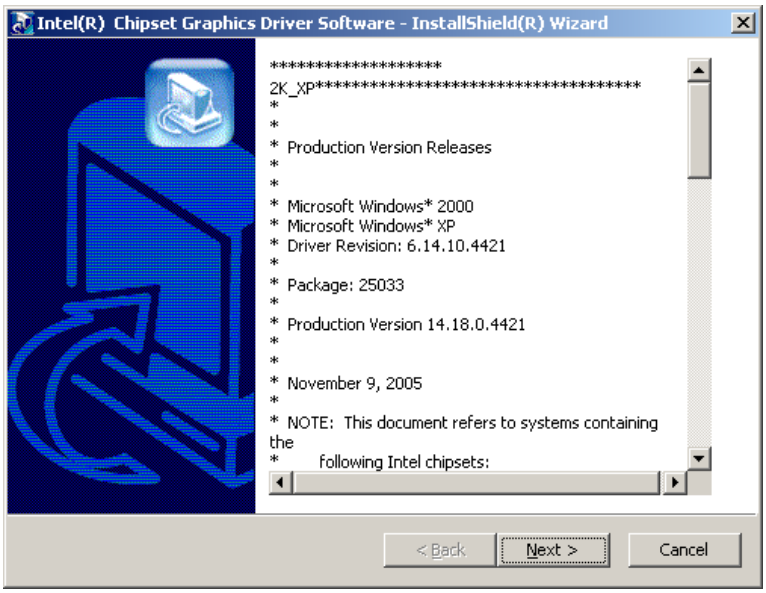


Figure 7-10: Intel® Graphics Media Accelerator InstallShield Wizard

Step 7: Read the Readme file information and click **NEXT** to begin extracting files (**Figure 7-11**).

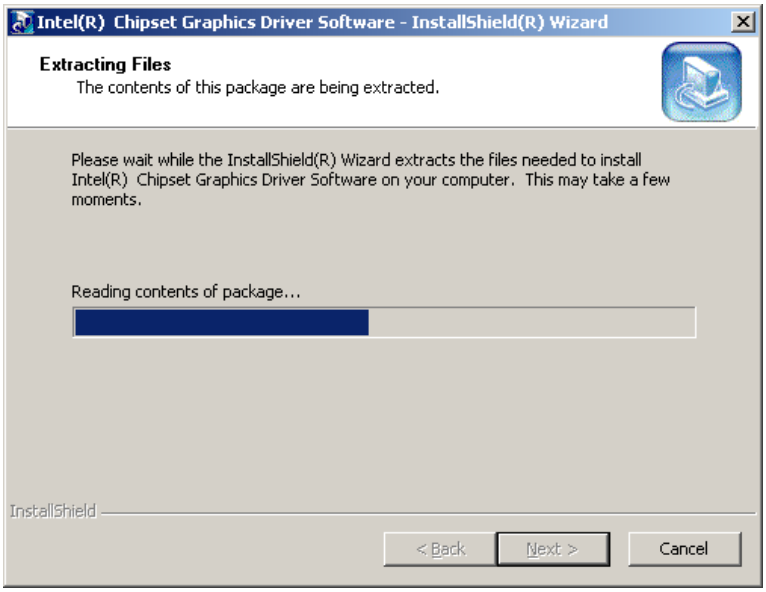

Intel(R) Chipset Graphics Driver Software - InstallShield(R) Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield(R) Wizard extracts the files needed to install Intel(R) Chipset Graphics Driver Software on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

Figure 7-11: InstallShield Wizard Extracting Files

Step 8: The **Graphics Media Accelerator Driver Welcome** screen appears (**Figure 7-12**).

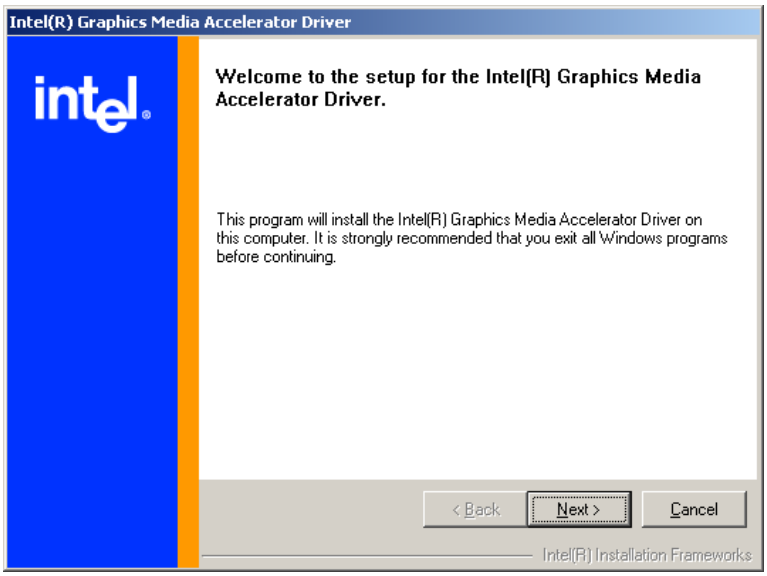

Intel(R) Graphics Media Accelerator Driver
intel
Welcome to the setup for the Intel(R) Graphics Media Accelerator Driver.
This program will install the Intel(R) Graphics Media Accelerator Driver on this computer. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-12: Intel® Graphics Media Accelerator Driver Welcome Screen

Step 9: Click **NEXT** and a license agreement appears (**Figure 7-13**).

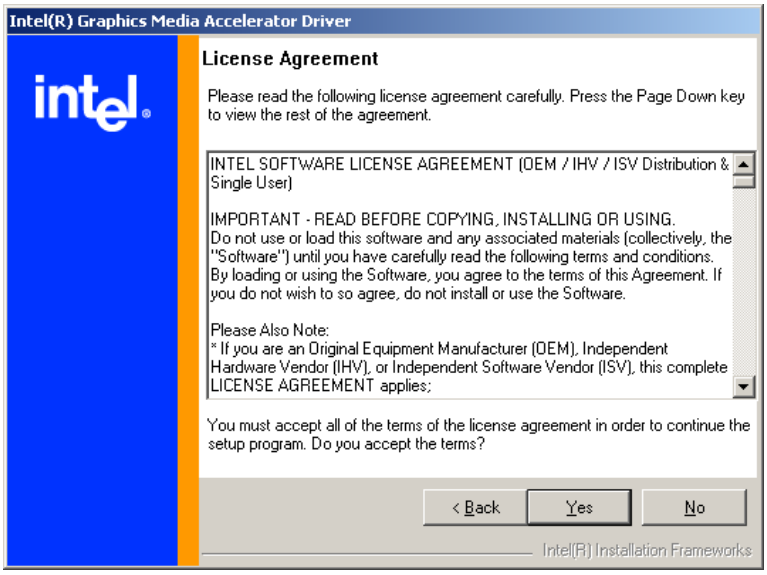

Intel(R) Graphics Media Accelerator Driver
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-13: Intel® Graphics Media Accelerator Driver License Agreement

Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the installation notice appears (**Figure 7-14**) as the driver is installed.

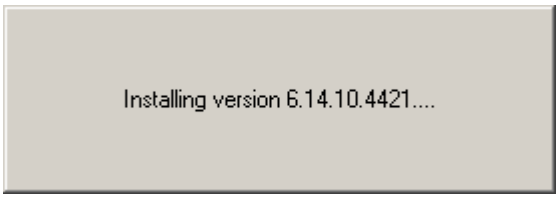


Figure 7-14: Intel® Graphics Media Accelerator Driver Installing Notice

Step 11: After the driver installation process is complete, a confirmation screen appears (**Figure 7-15**).

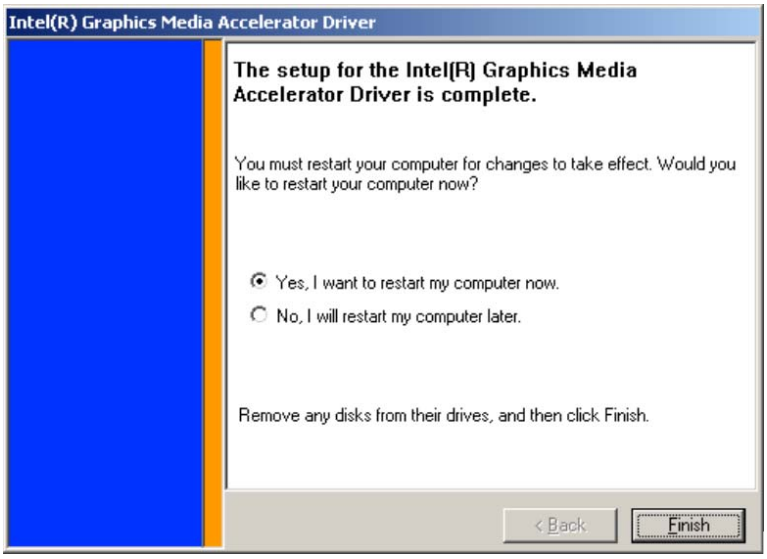

Intel(R) Graphics Media Accelerator Driver
The setup for the Intel(R) Graphics Media Accelerator Driver is complete.
You must restart your computer for changes to take effect. Would you like to restart your computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish.
< Back
Finish

Figure 7-15: Intel® Graphics Media Accelerator Installation Complete

Step 12: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.5 Intel® Network Adapter Installation

To install the Intel® Network Adapter, please follow the steps below.

Step 1: Select the LAN driver from the list in **Figure 7-2**.

Step 2: A new window opens **(Figure 7-16)**.

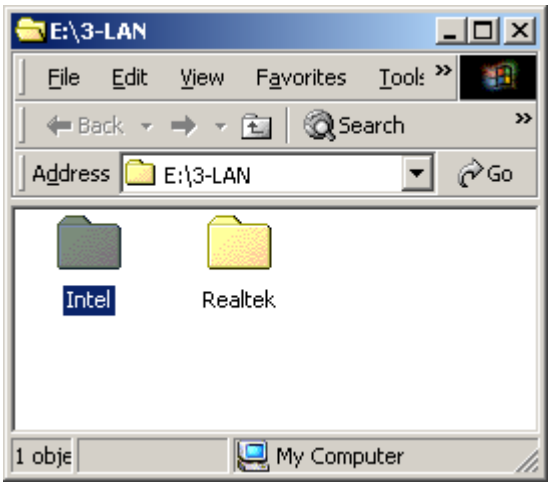


Figure 7-16: Select the Driver Folder

Step 3: Double-click the Intel folder.

Step 4: A new window appears (**Figure 7-17**).

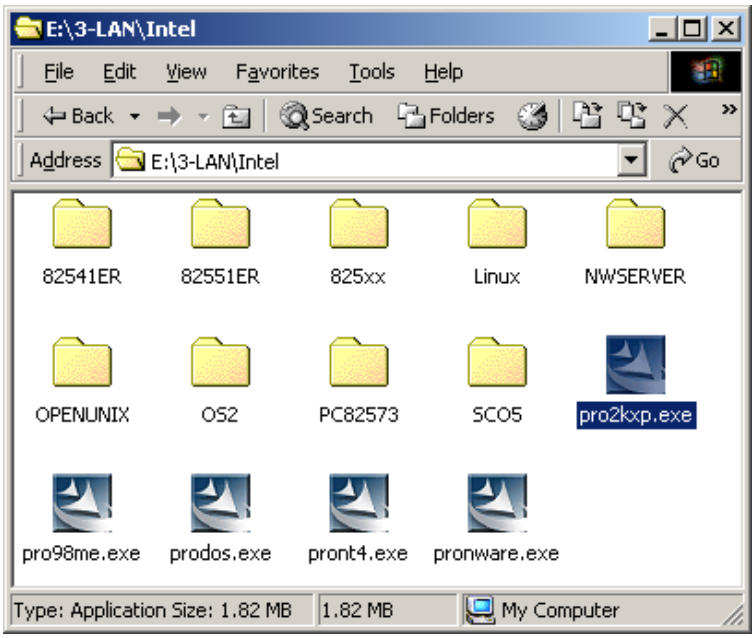


Figure 7-17: Select the Driver

Step 5: Double-click the appropriate installation program icon to continue the installation process.

Step 6: The license agreement in **Figure 7-18** appears.

DriverInstaller - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
INTEL SOFTWARE LICENSE AGREEMENT
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
I accept the terms in the license agreement
I do not accept the terms in the license agreement
InstallShield
< Back
Next >
Cancel

Figure 7-18: Network Adapter License Agreement

Step 7: Read the license agreement. To accept the terms and conditions stipulated in the agreement, select "**I accept the terms**…" and click **NEXT**.

Step 8: The **Location to Save Files** window (**Figure 7-19**) appears.

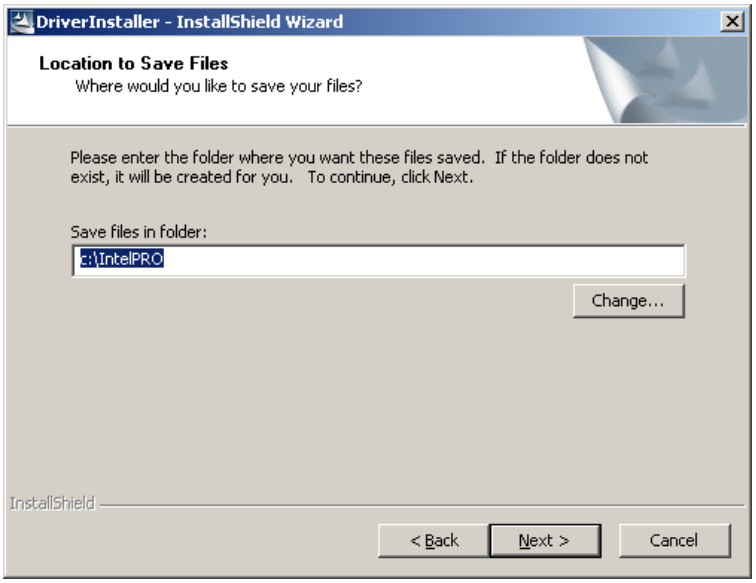

DriverInstaller - InstallShield Wizard
Location to Save Files
Where would you like to save your files?
Please enter the folder where you want these files saved. If the folder does not exist, it will be created for you. To continue, click Next.
Save files in folder:
c:\IntelPRO
Change...
InstallShield
< Back
Next >
Cancel

Figure 7-19: Location to Save Files

Step 9: Click **NEXT** to accept the default folder and begin extracting files (**Figure 7-20**).

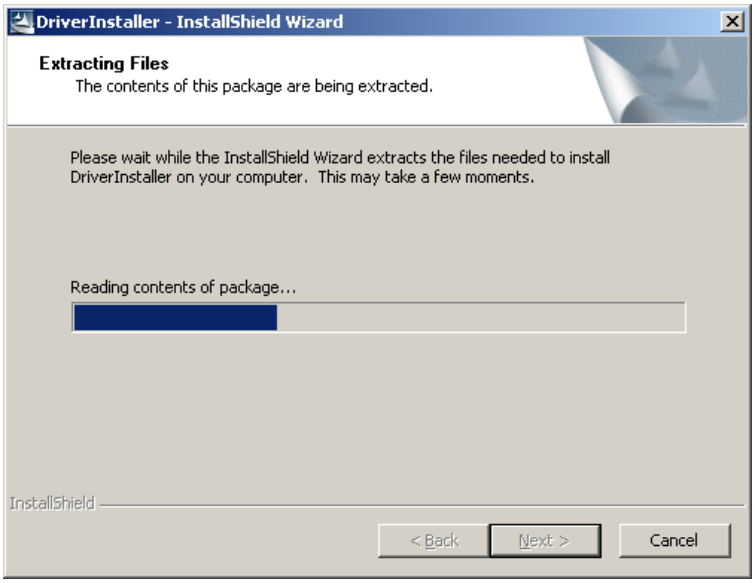

DriverInstaller - InstallShield Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield Wizard extracts the files needed to install DriverInstaller on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

Figure 7-20: InstallShield Wizard Extracting Files

Step 10: If the **Overwrite Protection** window appears (**Figure 7-21**), make the appropriate choice to either continue the installation process or not.

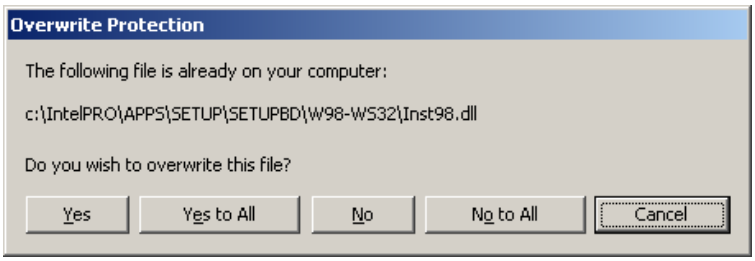


Figure 7-21: Overwrite Protection

Step 11: File extraction continues (**Figure 7-22**).

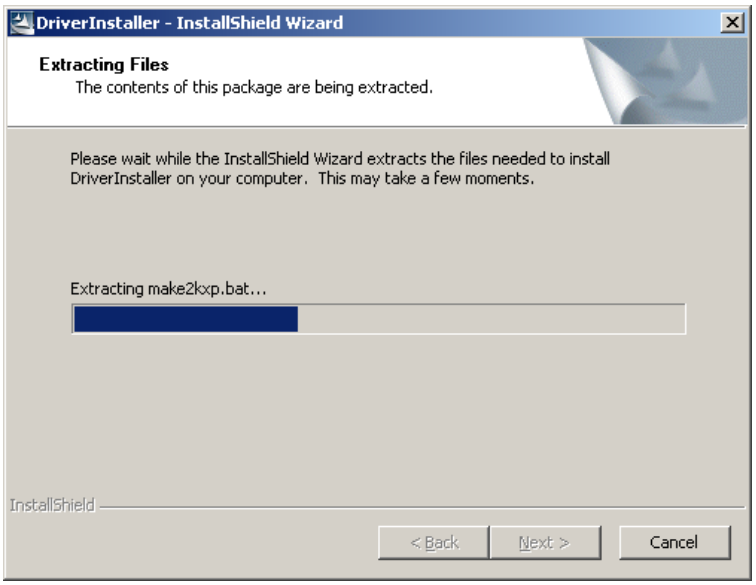

DriverInstaller - InstallShield Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield Wizard extracts the files needed to install DriverInstaller on your computer. This may take a few moments.
Extracting make2kxp.bat...
InstallShield
< Back
Next >
Cancel

Figure 7-22: File Extraction Continues

Step 12: The **Intel® Pro Network Connections** window appears (Figure 7-23).

Figure 7-23: Intel® Pro Network Connections

Step 13: Click **Install Base Driver** and an installation notice appears (Figure 7-24) as the driver is installed.

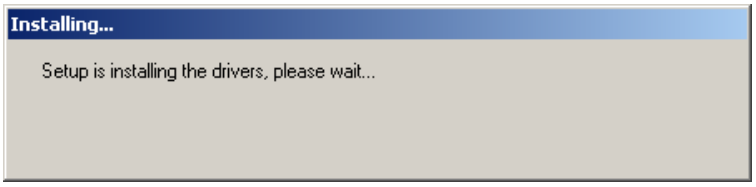


Figure 7-24: Intel® Pro Network Connections Driver Installation Notice

Step 14: After the driver is installed click **EXIT** in the **Intel® Pro Network Connections** window to exit the program.

7.6 Intel® USB 2.0 Installation

To install the Intel® USB 2.0 driver, please follow the steps below.

Step 1: Select **USB2.0** from the list in **Figure 7-2**.

Step 2: A new window opens (Figure 7-25).

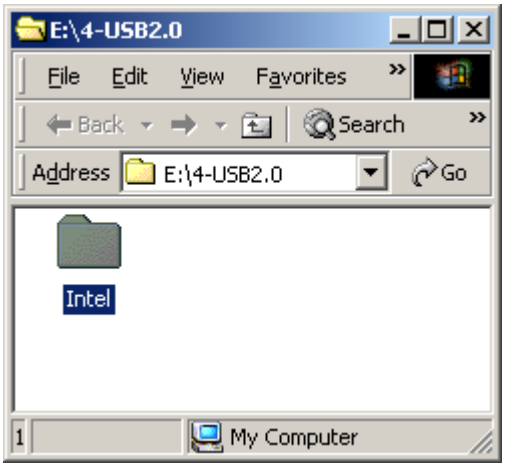


Figure 7-25: USB2.0 Window

Step 3: Double-click the **Intel** folder and a new window opens (Figure 7-26).

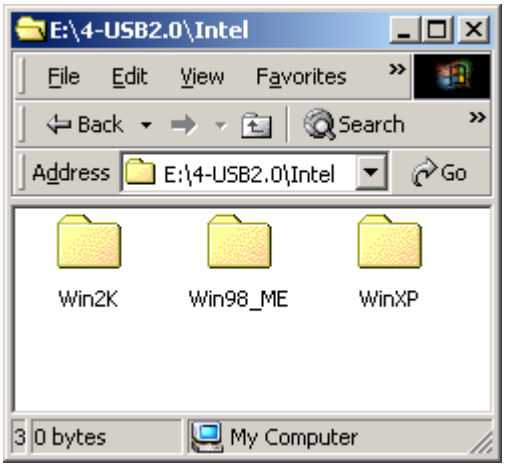


Figure 7-26: USB2.0 OS Options

Step 4: Double-click the appropriate OS folder.

NOTE:

The remainder of this installation assumes the use of Windows XP as the operating system.

Step 5: Double-click the **USB20.exe** program icon (Figure 7-27).

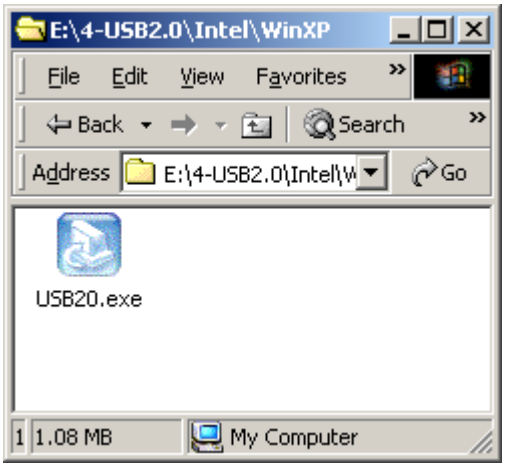


Figure 7-27: Windows XP USB 2.0 Program Icon

Step 6: The **InstallShield Wizard** is prepared to guide the user through the rest of the process (Figure 7-28).

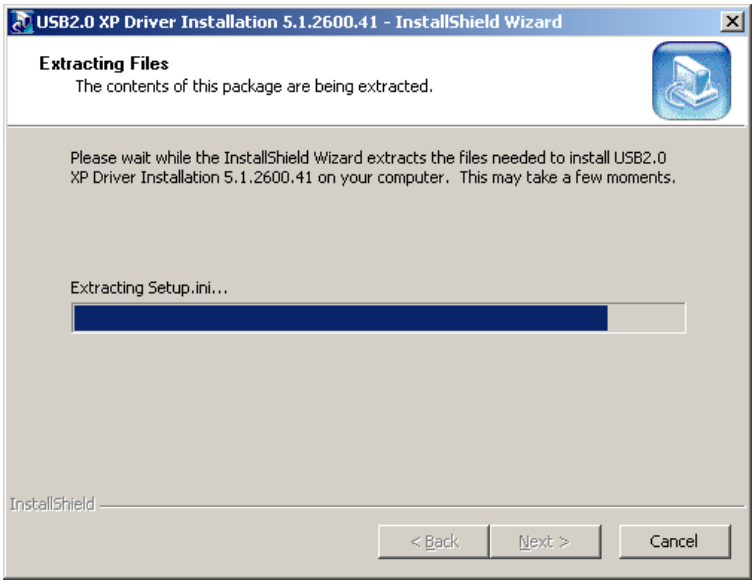

USB2.0 XP Driver Installation 5.1.2600.41 - InstallShield Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield Wizard extracts the files needed to install USB2.0 XP Driver Installation 5.1.2600.41 on your computer. This may take a few moments.
Extracting Setup.ini...
InstallShield
< Back
Next >
Cancel

Figure 7-28: USB 2.0 InstallShield Wizard

Step 7: The **InstallShield Wizard** continues (Figure 7-29).

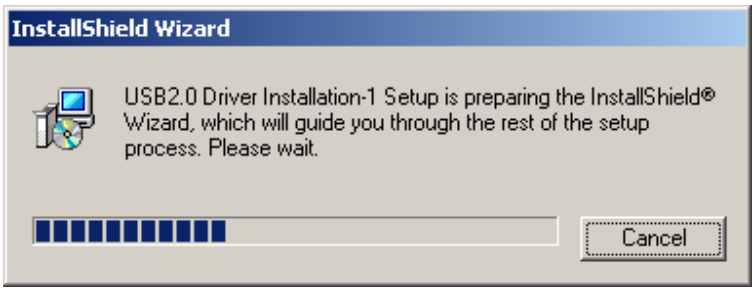

InstallShield Wizard
USB2.0 Driver Installation-1 Setup is preparing the InstallShield® Wizard, which will guide you through the rest of the setup process. Please wait.
Cancel

Figure 7-29: USB 2.0 InstallShield Wizard Continues

Step 8: Once initialized, the **InstallShield Wizard** welcome screen appears (Figure 7-30).

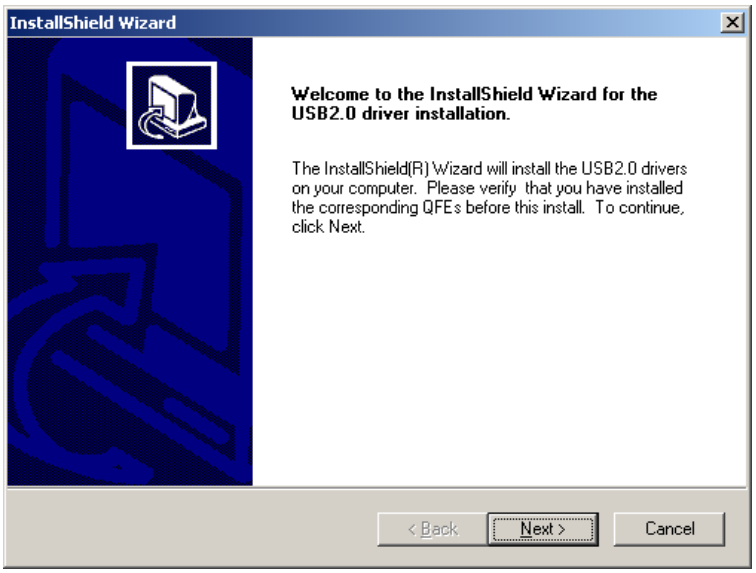

InstallShield Wizard
Welcome to the InstallShield Wizard for the USB2.0 driver installation.
The InstallShield(R) Wizard will install the USB2.0 drivers on your computer. Please verify that you have installed the corresponding QFEs before this install. To continue, click Next.
< Back
Next >
Cancel

Figure 7-30: USB 2.0 InstallShield Wizard Welcome Screen

Step 9: Click **NEXT** to continue the installation.

Step 10: The license agreement in Figure 7-31 appears.

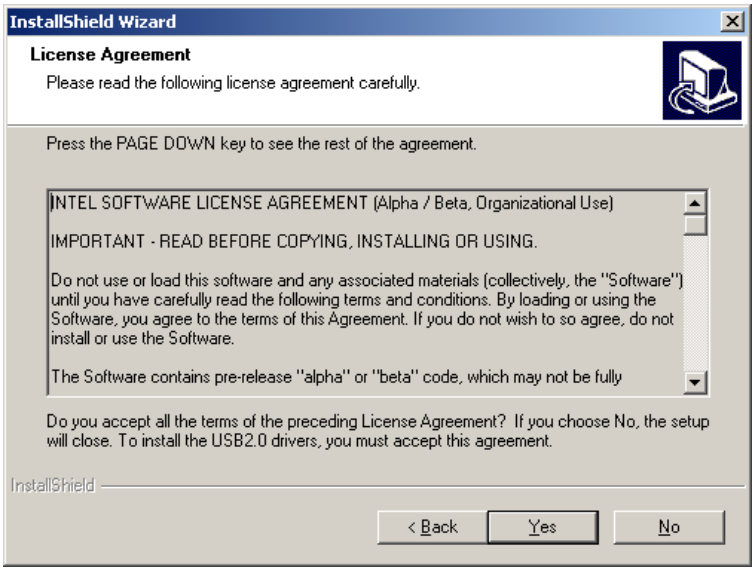

InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (Alpha / Beta, Organizational Use)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
The Software contains pre-release "alpha" or "beta" code, which may not be fully
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install the USB2.0 drivers, you must accept this agreement.
InstallShield
< Back
Yes
No

Figure 7-31: USB 2.0 License Agreement

Step 11: Read the license agreement. To accept the terms and conditions stipulated in the agreement click **YES**.

Step 12: InstallShield starts to install the new software as shown in Figure 7-32.

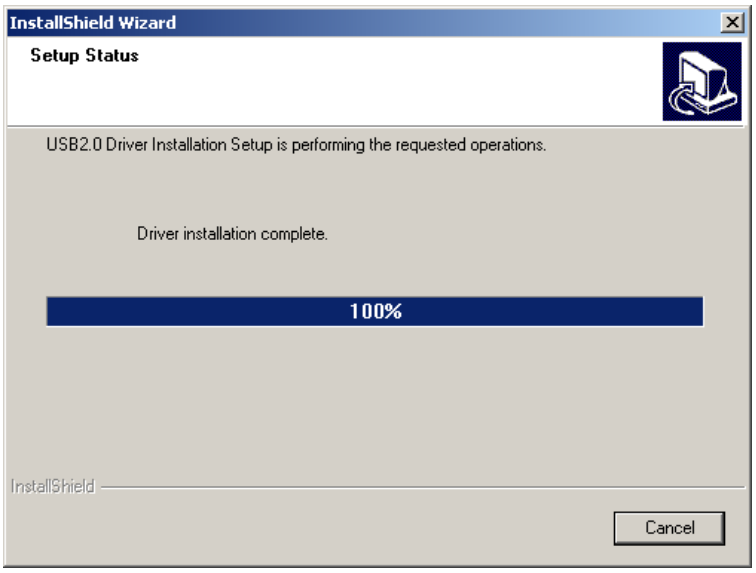


Figure 7-32: USB 2.0 Driver Installed

Step 13: After the driver installation process is complete, a confirmation screen appears (Figure 7-33).

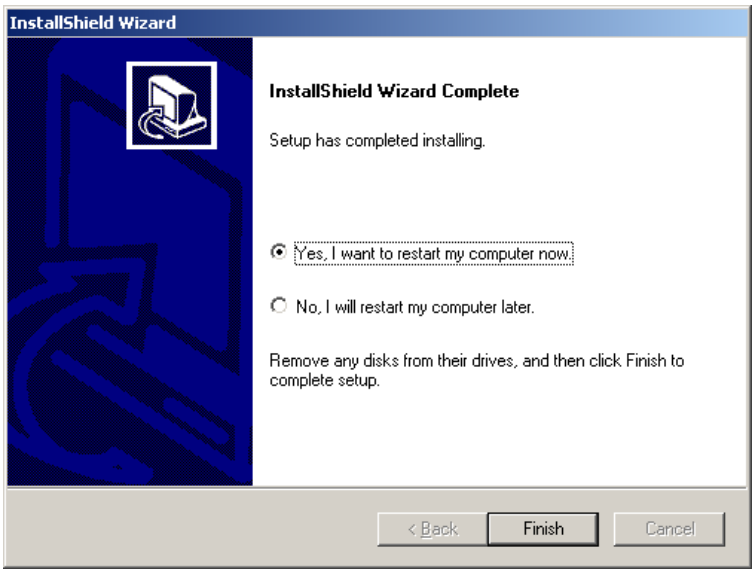

InstallShield Wizard
InstallShield Wizard Complete
Setup has completed installing.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

Figure 7-33: USB 2.0 Driver Installation Complete

Step 14: The confirmation screen offers the option of restarting the computer now or later.

For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.7 Realtek AC`97 Audio Driver (ALC665) Installation

To install the Realtek AC `97 audio driver, please follow the steps below.

7.7.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [AC`97].

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.7.2 Driver Installation

To install the audio driver please follow the steps below.

Step 1: Select **AUDIO** from the list in **Figure 7-2**.

Step 2: A new window opens (**Figure 7-34**).

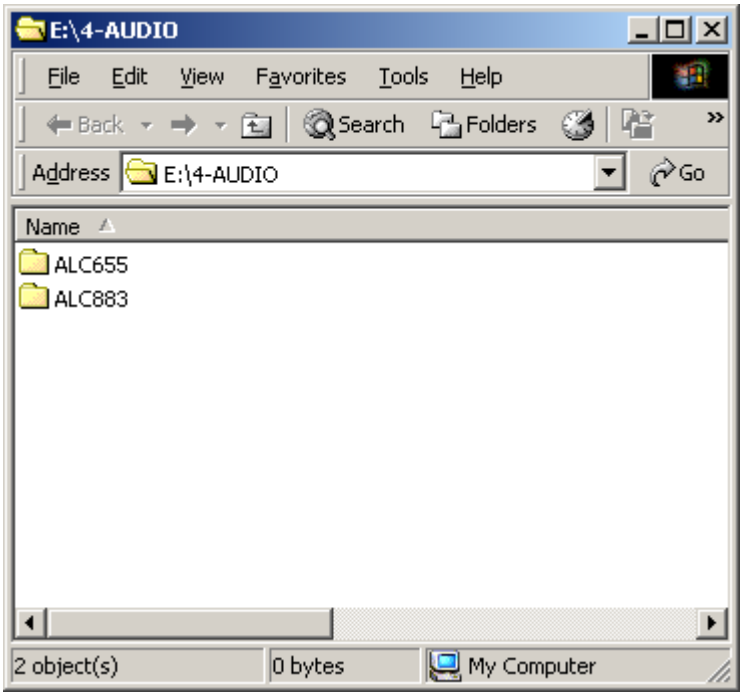


Figure 7-34: Select the Audio CODEC

Step 3: Double-click the ALC665 folder.

Step 4: Double-click the **Setup.exe** program icon in **Figure 7-35**.

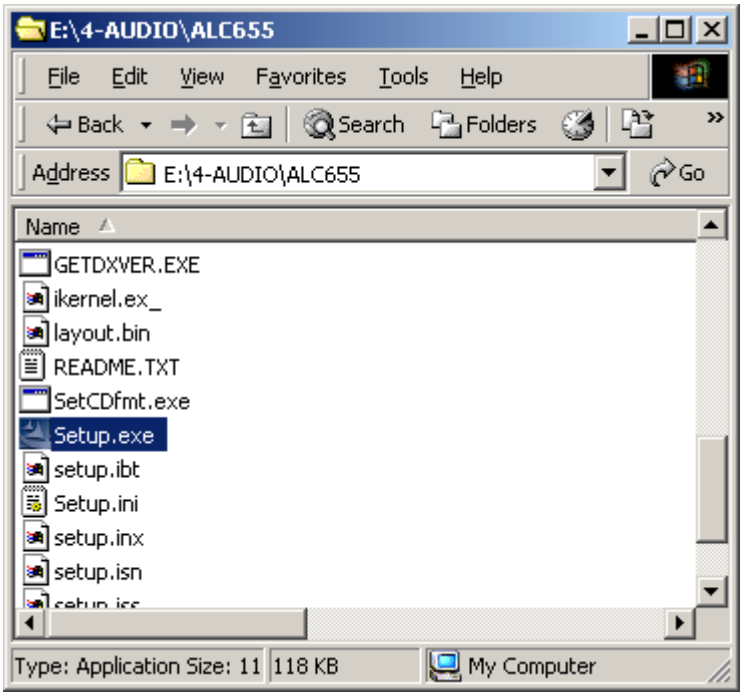


Figure 7-35: Locate the Setup Program Icon

Step 5: The **InstallShield Wizard** is prepared to guide the user through the rest of the process (**Figure 7-36**).

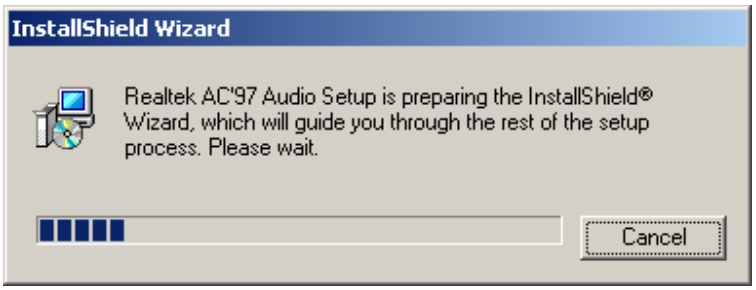

InstallShield Wizard
Realtek AC'97 Audio Setup is preparing the InstallShield® Wizard, which will guide you through the rest of the setup process. Please wait.
Cancel

Figure 7-36: Preparing Setup Screen

Step 6: Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 7-37**).

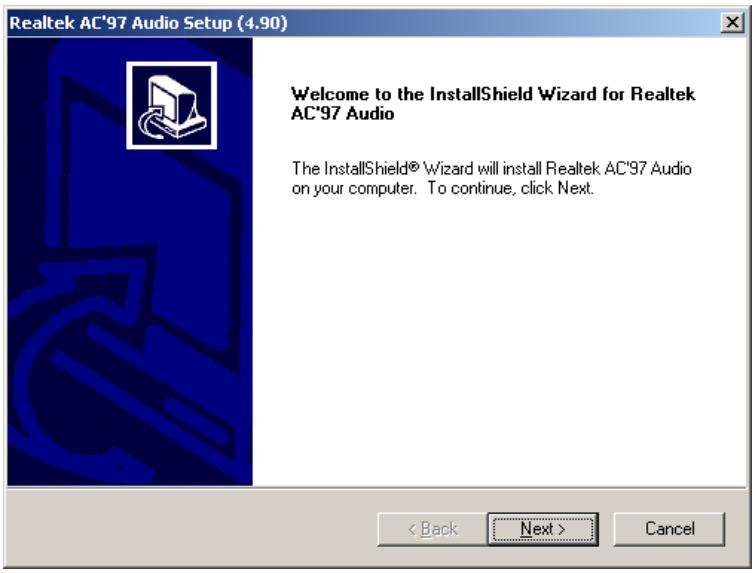

Realtek AC'97 Audio Setup (4.90)
Welcome to the InstallShield Wizard for Realtek AC'97 Audio
The InstallShield® Wizard will install Realtek AC'97 Audio on your computer. To continue, click Next.
< Back
Next >
Cancel

Figure 7-37: InstallShield Wizard Welcome Screen

Step 7: Click **NEXT** to continue the installation.

Step 8: InstallShield starts to install the new software as shown in **Figure 7-38**.

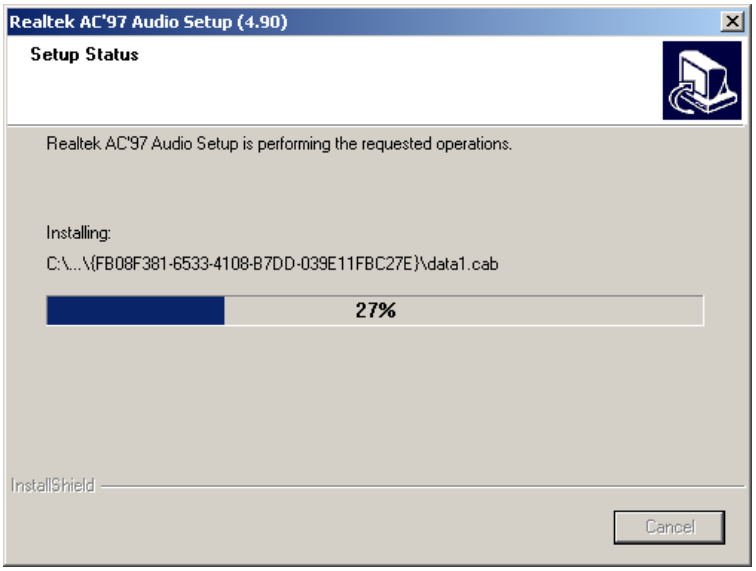


Figure 7-38: Audio Driver Software Configuration

Step 9: At this stage the **Digital Signal Not Found** screen shown in **Figure 7-39** appears.

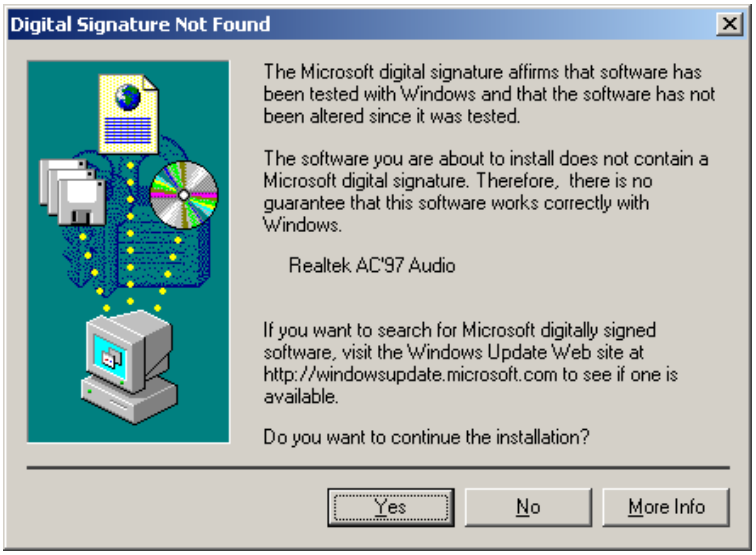

Digital Signature Not Found
The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.
The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.
Realtek AC'97 Audio
If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
Do you want to continue the installation?
Yes
No
More Info

Figure 7-39: Audio Driver Digital Signal

Step 10: Click **YES** and the driver installation begins (**Figure 7-40)**.

Figure 7-40: Audio Driver Installation

Step 11: After the driver installation process is complete, a confirmation screen appears (**Figure 7-41**).

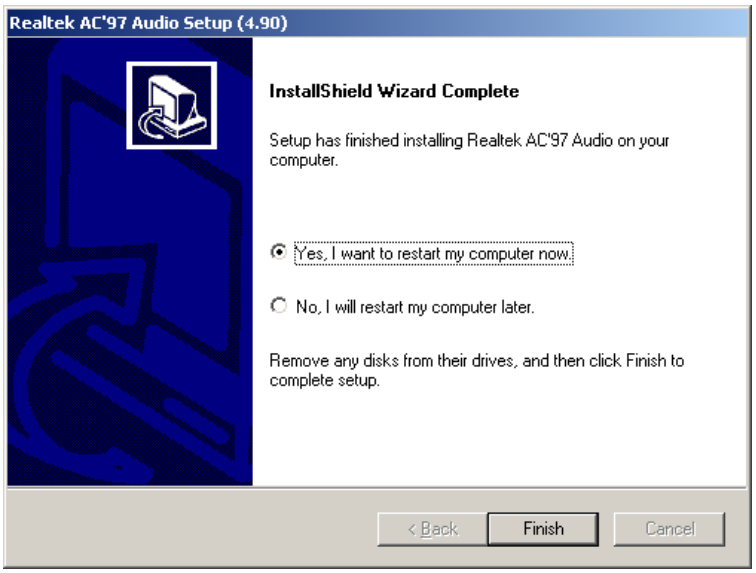

Realtek AC'97 Audio Setup (4.90)
InstallShield Wizard Complete
Setup has finished installing Realtek AC'97 Audio on your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

Figure 7-41: Restart the Computer

Step 12: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Appendix

A

BIOS Menu Options

A.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 6**.

- ➔ **System Overview 104**
- ➔ **System Time [xx:xx:xx] 105**
- ➔ **System Date [xx/xx/xx] 105**
- ➔ **CPU TM Function [Enabled] 108**
- ➔ **Intel (R) SpeedStep (tm) tech. [Automatic] 108**
- ➔ **OnBoard PCI IDE Controller [Both] 109**
- ➔ **Onboard PCI IDE Operate Mode [Legacy Mode] 110**
- ➔ **IDE 0 (Master) and IDE 1 (Slave) 110**
- ➔ **Auto-Detected Drive Parameters 111**
- ➔ **Type [Auto] 112**
- ➔ **ZIP 112**
- ➔ **LS-120 ..... 112**
- ➔ **LBA/Large Mode [Auto] 112**
- ➔ **Block (Multi Sector Transfer) [Auto] 113**
- ➔ **PIO Mode [Auto] 113**
- ➔ **DMA Mode [Auto] 114**
- ➔ **S.M.A.R.T [Auto] 115**
- ➔ **32Bit Data Transfer [Enabled] 115**
- ➔ **Serial Port1 Address [3F8] 116**
- ➔ **Serial Port2 Address [2F8] 116**
- ➔ **Serial Port2 Mode [Normal] 117**
- ➔ **Serial Port3 Address [A20] 117**
- ➔ **Serial Port4 Address [A28] 117**
- ➔ **Serial Port5 Address [A30] 118**
- ➔ **Serial Port6 Address [A38] 118**
- ➔ **USB Configuration 120**
- ➔ **USB Devices Enabled 120**
- ➔ **USB Function [6 USB Ports] 121**

➔ Legacy USB Support [Enabled] 121
➔ USB 2.0 Controller [Enabled] 122
➔ USB 2.0 Controller Mode [HiSpeed] 122
➔ Device ## 123
➔ Emulation Type [Auto] 123
➔ Clear NVRAM [No] 125
➔ Plug & Play O/S [No] 125
➔ PCI Latency Timer [64] 126
➔ Allocate IRQ to PCI VGA [Yes] 126
➔ Palette Snooping [Disabled] 126
➔ PCI IDE BusMaster [Disabled] 127
➔ OffBoard PCI/ISA IDE Card [Auto] 127
➔ IRQ# [Available] 128
➔ DMA Channel# [Available] 129
➔ Reserved Memory Size [Disabled] 130
➔ Quick Boot [Enabled] 131
➔ Quiet Boot [Disabled] 131
➔ Boot From LAN Support [Disabled] 132
➔ Spread Spectrum Mode [Disabled] 132
➔ Change Supervisor Password 136
➔ User Access Level [Full Access] 137
➔ Change User Password 137
➔ Clear User Password 137
➔ Password Check [Setup] 137
➔ DRAM Frequency [Auto] 139
➔ Configure DRAM Timing by SPD [Enabled] 139
➔ DRAM CAS# Latency [2.5] 140
➔ DRAM RAS# Precharge [3 Clocks] 140
➔ DRAM RAS# to CAS# Delay [3 Clocks] 141
➔ DRAM RAS# Precharge Delay [7 Clocks] 141
➔ DRAM Burst Length [4] 141
➔ Memory Hole [Disabled] 142

- ➔ Init. Graphic Adapter Priority [Internal VGA] 142
- ➔ Internal Graphics Mode Select [Enable, 8MB] 142
- ➔ Graphics Aperture Size [64MB] 143
- ➔ DVMT Mode Select [Combo Mode] 143
- ➔ Boot Display Device 144
- ➔ Flat Panel Type 144
- ➔ Local Flat Panel Scaling [Auto] 144
- ➔ OnBoard AC97 Audio DEVICE [Auto] 145
- ➔ Power Button Mode [On/Off] 146
- ➔ Restore on AC Power Loss [Last State] 147
- ➔ Power Supply Mode [ATX] 147
- ➔ Resume on Ring [Disabled] 147
- ➔ Resume on PME# [Disabled] 148
- ➔ Resume On RTC Alarm [Disabled] 148
- ➔ RTC Alarm Date (Days) 148
- ➔ System Time 148
- ➔ Save Changes and Exit 149
- ➔ Discard Changes and Exit 149
- ➔ Discard Changes 149
- ➔ Load Optimal Defaults 149
- ➔ Load Failsafe Defaults 150

Appendix

B

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table B-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H
;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H
;
; EXIT ;
```

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Appendix

C

Address Mapping

C.1 IO Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	SiS661CX Graphics Controller
3C0-3DF	SiS661CX Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table C-1: IO Address Map

C.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table C-2: 1st MB Memory Address Map

C.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table C-3: IRQ Mapping Table

C.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table C-4: IRQ Mapping Table

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Appendix

D

External AC'97 Audio CODEC

D.1 Introduction

The motherboard comes with an onboard Realtek ALC655 CODEC. The ALC655 is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC that provides three pairs of stereo outputs with 5-bit volume control, a mono output, and multiple stereo and mono inputs, along with flexible mixing, gain, and mute functions.

D.1.1 Accessing the AC'97 CODEC

The CODEC is accessed through the phone jacks on the rear panel of the motherboard. The phone jacks include:

- LINE IN
- LINE OUT
- MIC IN

D.1.2 Driver Installation

The driver installation has been described in **Section 7.6**.

After rebooting, the sound effect configuration utility appears in the **Windows Control Panel** (**Figure D-1**). If the peripheral speakers are properly connected, sound effects should be heard.

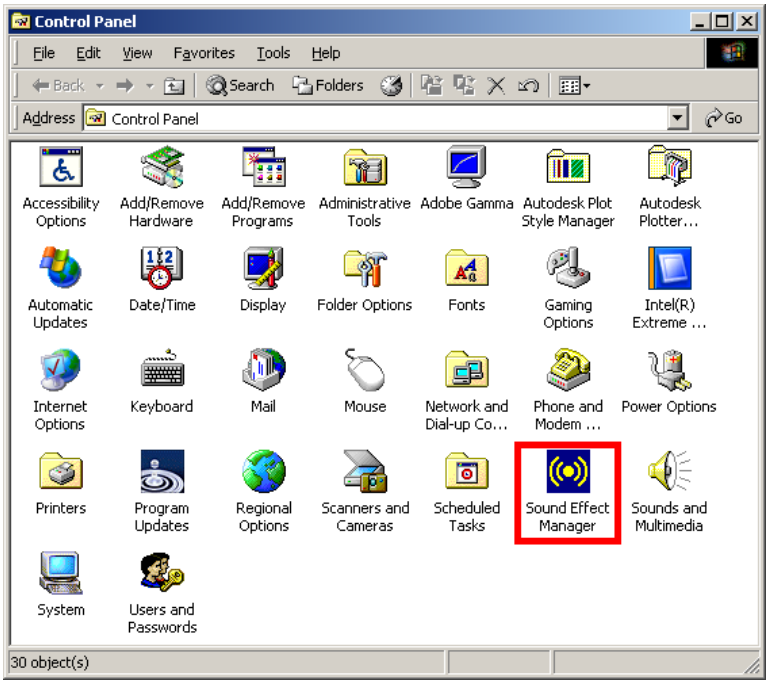

Figure D-1: Control Panel Sound Effect Manager

D.2 Sound Effect Configuration

D.2.1 Accessing the Sound Effects Manager

Follow the steps below to access the **Sound Effect Manager**.

Step 1: Install the ALC655 audio CODEC driver (see **Section 7.6**).

Step 2: Click the **Sound Effect Manager** icon in the system task bar (**Figure D-2**).

Figure D-2: Sound Effect Manager Icon [Task Bar]

Step 3: The sound effect manager appears (**Figure D-3**).

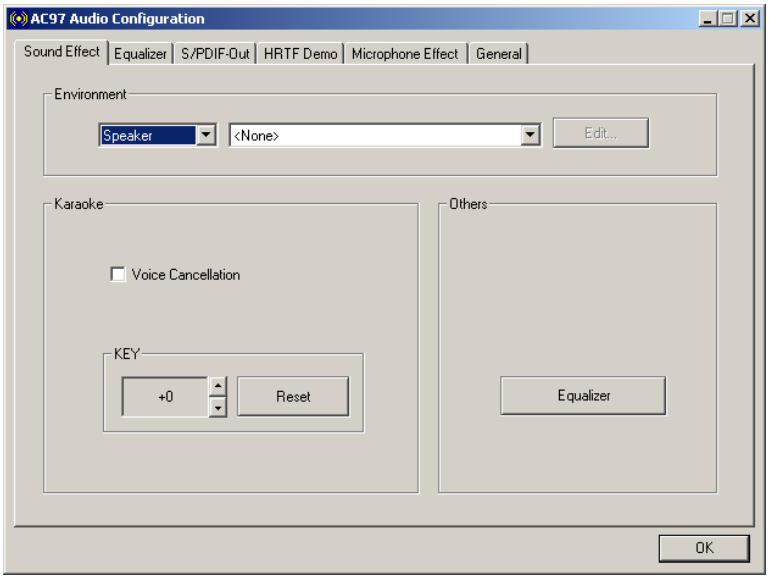

Figure D-3: Sound Effects Manager (ALC655)

NOTE:

The Sound Effect Manager shown in **Figure D-3** is for the RealTek ALC655 audio CODEC. Different CODECs may have different sound manager appearances.

The following section describes the different configuration options in the Sound Effect Manager.

D.2.2 Sound Effect Manager Configuration Options

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** (**Figure D-3)**.

NOTE:

The Karaoke Mode is configured in the Sound Effect menu. To access Karaoke configuration settings, click on the Sound Effect menu tab.

- Sound Effect
- Karaoke Mode
- Equalizer
- Speaker Configuration
- Speaker Test
- S/PDIF-In
- S/PDIF-Out
- Connector Sensing
- HRTF Demo
- Microphone Effect
- General

NOTE:

Not all RealTek Sound Effect Managers have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- ***Sound Effect*** - Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. Click **EDIT** to edit the sound effect.
- ***Karaoke Mode*** - **Karaoke Mode** is accessed in the Sound Effect tab. The **Voice Cancellation** disables the vocal part of the music being played. The

Key adjustment up or down arrow icons enable users to define a key that fits a certain vocal range.

- ***Equalizer Selection*** - Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.
- ***Speaker Configuration*** - Multi-channel speaker settings are configured in this menu. Configurable options include:
  - Headphone
  - Channel mode for stereo speaker output
  - Channel mode for 4 speaker output
  - Channel mode for 5.1 speaker output
  - Synchronize the phonejack switch with speakers settings
- ***Speaker Test*** - Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.
- ***S/PDIF-In & S/PDIF-Out*** - S/PDIF is used to transmit digital and analog audio signals with either a 48 or 44.1kHz sample rate.
- ***HRTF Demo*** - Adjust HRTF (Head Related Transfer Functions) 3D positional audio before running 3D applications.
- ***Microphone Effect*** - Microphone noise suppression is enabled in this menu.
- ***General*** - General information about the installed AC'97 audio configuration utility is listed here.

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